MODERN PLASTICS

MAY 1948

THE ability of Durez to *play almost any position* on your materials team is well illustrated in the heat-resistant field. From spark-plug tester bodies to vacuum cleaner housings . . . from kitchenware handles to heat control fittings . . . this group of phenolic compounds takes over the job of turning back heat.

With this property of Durez you can combine others almost at will . . . impact strength, electrical properties, water resistance, and others. Your molder will be sure to like the easy moldability of the right Durez for your job.

A meeting with our service staff . . . specialists in the most *versatile* of all the plastics . . . might be an excellent thing for *your* business. Our enlarged capacity and perfected quality controls can help to solve your production problems. To know each month what others are accomplishing with Durez, let us send you "Durez Plastics News".

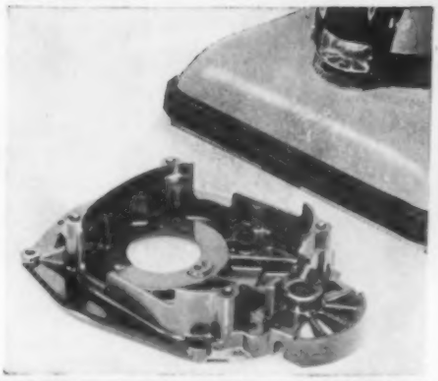
Durez Plastics & Chemicals, Inc., 125 Walck Road, North Tonawanda, New York. *Export Agents: Omni Products Corp., 460 Fourth Ave., New York 16, N.Y.*

Put DUREZ in your design to

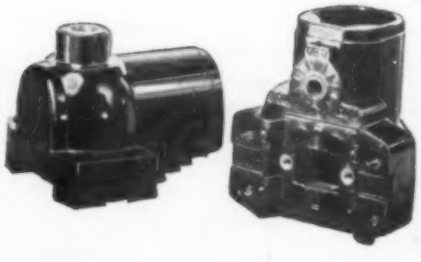
stop heat cold!

PISTOL-GRIP HANDLE

SPARK PLUG CHECKER



RE-STYLED HOOVER



SWITCH PLUGS

PISTOL-GRIP HANDLE. The famous Revere Copper-Clad Stainless Steel saucepan sports a handle styled for smartness and comfort. Color-fast Durez keeps cool and safe...is heat-resistant...retains satin-smooth finish. Design eliminates twisting and turning in hand.

SPARK PLUG CHECKER. Mechanics' time-saver is the King McCoy Spark Plug Checker which also gives accurate scale readings of coil output, simplifies location of defective leads on contacts. Heat resistance and dielectric strength of Durez plastic body assure dependable measurements.

RE-STYLED HOOVER. One of 11 Durez parts in this modern Hoover cleaner, the motor case is molded in a heat-resistant compound with excellent electrical properties and dimensional stability. Plastics contribute to light weight, improved appearance, and ability to take abuse.

SWITCH PLUGS. Excellent moldability of heat-resistant Durez is shown in the complicated form of these one-piece transfer molded switch plugs. Plugs have molded-in inserts, possess high dielectric strength with heat resistance. A Durez phenolic serves better than any other material in applications like this.

DUREZ

PHENOLIC RESINS

- MOLDING COMPOUNDS
- INDUSTRIAL RESINS
- PROTECTIVE COATING RESINS

PHENOLIC PLASTICS that fit the job

TECHNOLOGY DEPARTMENT
PUBLIC LIBRARY
MAR 1948
DETROIT

Catalin...Highest "Eye-Q" Reception Rating in Radio

The swath which *Catalin* cuts across the radio field goes straight thru the active center, where buying reception and response are strong—and where the sales harvest is heavy!

Catalin is Radio's SEEN quality! In this role it stars superlatively! Its incomparable eye-appealing beauty pre-sells inbuilt tonal perfection, thereby immeasurably advancing the prestige and further acceptance of the maker's good name.

Catalin cabinets, especially when dealer-displayed with other contending compositions, stand apart from and above competition. The gem-like richness of *Catalin* color and the material's magnificent stateliness, activate selection . . . cause table model sales to step right up, from brackets stagnated by too many half-choices, to middle levels that are steady and profit-productive!

Now that the radio buying public is free to choose—those, who might otherwise pay less, for something less, are gladly paying the trifle more that gives them so much more in *Catalin!* And—conversely—those, whose circumstances are above price-shopping, have discovered that for very little, *Catalin* gives them the very best.

A saying goes that—"you pay for what you get and you get only what you pay for". If *Catalin* costs more, the slight extra you pay is for the extra weight you receive . . . this, and skilled hand finishing! The casting processes employed make *Catalin* "stout hearted, not thin skinned"! Its wall structures are heavier, require more material, are less fragile. And, since *Catalin* is color, all color, depth adds values that no other material can match.

Investment-wise, the manufacturer risks less financially in having *Catalin* tooled up to his requirements . . . he can start faster—get to market quicker—carry a low inventory—and, when need be, make subsequent model changes without crippling his costs!

Catalin's world is a bright world—replete with opportunity—not alone for radio, but for all marketers of things beautiful. To assist your entry into such a world, *Catalin* invites your inquiry!

CATALIN CORPORATION OF AMERICA
ONE PARK AVENUE • NEW YORK 16, N. Y.

CATALIN
THE GEM OF PLASTICS
Catalin

CAST RESINS • LIQUID RESINS • MOLDING COMPOUNDS

MODERN PLASTICS*

CONTENTS

GENERAL

PLASTICS ENGINEERING

TECHNICAL

DEPARTMENTS

PUBLICATION OFFICE: Orange, Conn. Executive and Editorial Office: 122 E. 42nd St., New York 17, N. Y. Published each month by Modern Plastics, Inc. Entered as second class matter, at the Post Office at Orange, Conn., under the act of March 3, 1879. Copyright 1948 by Modern Plastics, Inc. All rights reserved. Subscription $5.00 a year, $8.00 for two years in U. S., its possessions and South America. Canadian subscriptions $5.50 a year, $9.00 for two years. All other countries $6.00 a year. $10.00 for two years, payable in U. S. currency. Price of this issue 75¢ per copy.

* Reg. U. S. Patent Office.

HOPPLES keep pacers in stride...

Hopples by Glyde-Rite Corp., Zanesville, Ohio

. . . and reveal a new use for GEON polyvinyl resins

IF you were driving a pacer you'd want him to wear a hopple.

And you would prefer a hopple made of Geon polyvinyl resins because, unlike leather, it would not pick up moisture as the horse sweats, "gumminess" would not pull the hair on the horse's leg—and you would probably never have to buy a replacement part.

Only a few thousand hopples will be made, for there aren't so many pacers. But many products can now have the same combination of practical properties the maker of hopples found when he went to Geon polyvinyl resins. He got high strength with light weight . . . resistance to oils and grease . . . ability to match owners' colors . . . long life and suppleness. He found, too, that this material can be wiped clean with a damp cloth, replacing laborious saddle-soaping.

Geon can be extruded, pressure or injection molded, used as a coating or impregnant, calendered or cast in sheets or film. We make no finished products from Geon—or from any of our other raw materials. However, we are glad to work on special problems or applications. We are particularly interested in developing new uses. For more information, please write Department O-5, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, O.

B. F. Goodrich Chemical Company

A DIVISION OF THE B. F. GOODRICH COMPANY

GEON polyvinyl materials • HYCAR American rubber • KRISTON thermosetting resins • GOOD-RITE chemicals

2 MATERIALS... 2 MOLDING METHODS

All CHICAGO MOLDED PLASTICS

That's what it takes . . two materials, thermoplastic and thermosetting . . . and two molding methods, compression and injection . . . to provide the strength, rigidity, toughness and overall beauty in the new, precision-built Sunbeam Shavemaster.

For protection and appearance, the two sections of the housing are injection molded of a rich grey cellulose acetate . . . light . . . tough . . . combining beauty with extra strength.

The bearing blocks, on the other hand, were produced from high production plunger type molds using a medium impact phenol formaldehyde material. This provides the necessary impact strength, electrical insulation, and rigidity for the support of the operating parts.

As usual, it's a Chicago Molded job throughout . . . engineering, mold-making, molding, finishing. It's a good example of the sound engineering and efficient production facilities of CMPC. And by procuring all these parts from the same reliable source, Sunbeam has insured uniformity of plastics engineering plus a continuous flow of parts to their production line.

Sunbeam, like scores of other industrial leaders, has come to look upon Chicago Molded as a preferred source of supply for the best in molded plastics. We believe you, too, will find this a good place to bring your next plastics molding job. May we discuss it with you? Just phone or write . . . there's no obligation.

CHICAGO MOLDED PRODUCTS CORPORATION

1046 N. Kolmar Ave. **Chicago 51, Illinois**

Representatives in principal industrial centers

COMPRESSION and **INJECTION** molding of all plastic materials

EDITORIAL STAFF
Editor: CHARLES A. BRESKIN
Managing Editor: A. PAUL PECK
Technical Editor: DR. GORDON M. KLINE
Engineering Editor: FRED B. STANLEY
Features Editor: R. L. VAN BOSKIRK
Art Director: DONALD R. RUTHER
Midwestern Editor: VAL WRIGHT
Associate Editor: VIRGINIA SUE WILSON
Associate Editor: WARREN H. GOODMAN
Readers Service: EMMA TURAK

EXECUTIVE STAFF
Publisher: CHARLES A. BRESKIN
General Manager: ALAN S. COLE
Associate Publisher: HIRAM MCCANN

BUSINESS STAFF
Advertising Manager: ALAN S. COLE

P. H. Backstrom — A. M. Rothenberg
M. A. Olsen — Burton W. Gussow
J. M. Connors — Joseph A. Drucker
R. C. Beggs — W. F. Kennedy

Promotion Manager: JOHN G. KASTEN
Production Manager: DANIEL M. BROADS
Asst. Production Manager: B. J. FARINA

Executive and Editorial Offices:
122 E. 42nd St., New York 17, N. Y.
Tel., MUrray Hill 3-0655

Circulation Department
Circulation Manager: FREDERICK A. KLEIN
32 Broadway, New York 4, N. Y.
Tel., WHitehall 4-4782

Branch Offices
Chicago 1: 221 N. La Salle St.
Manager: J. M. Connors
Tel., Randolph 5588

Cleveland 14: 815 Superior Ave.
Manager: R. C. Beggs
Tel., Superior 0737

Los Angeles 5: 2412 W. 7th St.
Manager: A. M. Rothenberg
Tel., Fairfax 6255

London, England: Transatlantic Publicity, Ltd., 20/21 Broad Street Ave., Bromfield St., London E.C. 2.
Manager: L. H. Dolaro

MODERN PLASTICS is fully protected by copyright and nothing that appears in it may be reprinted wholly or in part, without special permission.

Member Audit Bureau of Circulation
Member Associated Business Papers
MODERN PLASTICS is regularly indexed in Industrial Arts Index and Industex.

EDITORIAL

The Quest for Coal

Benzol—phenol—styrene—naphthalene! These are words to conjure with in the plastics industry. Unfortunately, the scarcity of these chemicals has been given so frequently as the reason why the molder, processor, or buyer of plastics can't always get satisfactory materials that he has become annoyed with this ever-recurring excuse.

At the risk of seeming repetitious, we feel it our duty once more to inform our readers that the immediate future shows scant promise of improvement. Indeed, if present domestic and world affairs continue their rambunctious course, the shortage of coal chemicals could become one of this nation's most serious supply problems.

Benzol is the key. Styrene and synthetic phenol are primarily dependent upon it, and styrene is a necessary component for the production of GR-S rubber. A newly announced process for formulating synthetic rubber means that demand for synthetic rubber will probably increase, and about 25% styrene monomer is required for every pound of GR-S synthetic rubber produced.

The potential demand for benzol in 1948, before a stepped-up national defense program was considered, was reported to be 190,000,000 gal., but the most optimistic producers expect no more than 175,000,000 gal. production following a record 165,000,000 in 1947. Other industries, aside from plastics and rubber, are demanding ever-increasing quantities of benzol, but the phenolic molding industry alone has increased from a 12,000,000-lb. monthly capacity in 1945 to an almost 19,000,000-lb. consumption rate in January 1948.

It is possible that contemplated additional facilities for styrene and phenol could take care of the demand for these chemicals, but where the benzol is coming from for any greatly expanded plastics and rubber production in the near future is a real problem.

A long range view of this situation is not too disturbing, for American ingenuity has a way of meeting this type of problem; but the supply availability for the next 2 years is far from comforting if consumption continues on the upgrade. Furthermore, several of the currently large markets for phenolic molded parts seem near saturation, and there is always the danger that molders will lessen their efforts to find new markets if they fear a possible shortage of raw materials. Users of phenolics would be well advised to be alert to this perplexing problem of meeting a temporary possible phenol scarcity while planning for expanded markets to use their increased production capacity in the future.

Maybe We've Got the Combination to Your Moulded Plastic Job

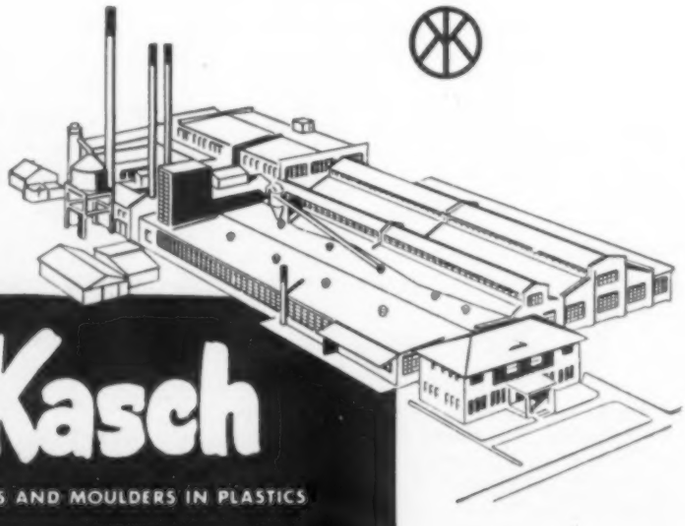
There's no "Open Sesame" to a new moulding problem. Getting results takes the same old patient hunt for the proper combination—in every function from design and engineering right through mould-making, moulding, finishing and the rest.

But there's this bit of magic that still works. Knowing these problems . . . having solved similar puzzles before . . . experienced moulders are liable to get there quicker. And with methods that have been tried and proved.

So look a little deeper than the price tag on your moulder's bid. Experience like ours — a reputation like ours — experienced personnel and a complete, self-integrated plant like ours—these things mean we'll quote a fair price on a job you can depend on quality-wise, cost-wise and delivery-wise.

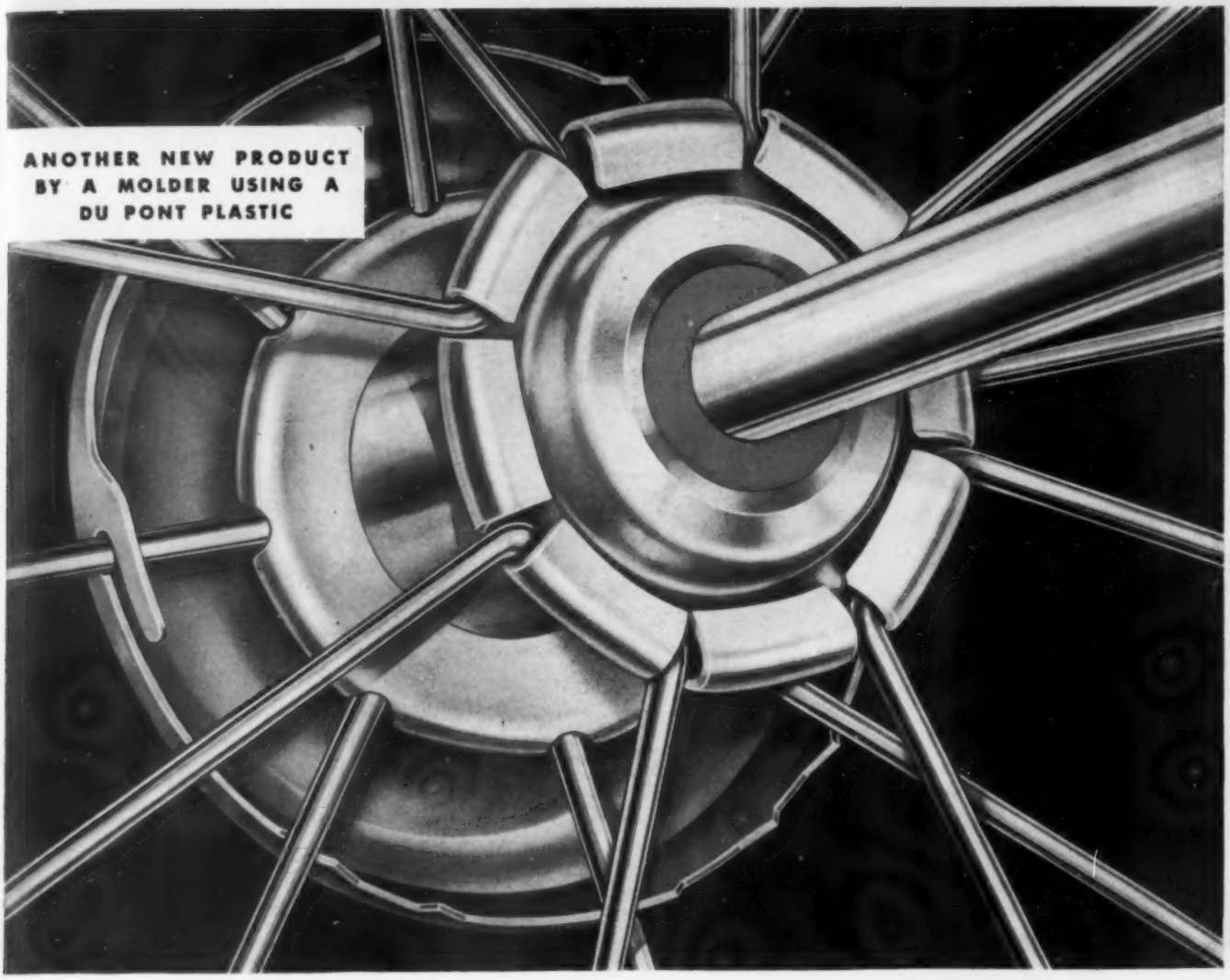
We're interested in your business, if either compression, transfer or plunger moulding will do the job. May we send a sales engineer?

Kurz-Kasch, Inc., 1415 S. Broadway, Dayton 1, Ohio
BRANCH SALES OFFICES: New York, *Lexington 2-6677* Chicago, *Harrison 5473* • Detroit, *Randolph 5214* Franklin, Pa., *Venango County 186* • Los Angeles, *Prospect 7503* • Dallas, *Lakeside 1022* • St. Louis, *Rosedale 3542* • Toronto, Canada, *Adelaide 1377.*
EXPORT OFFICES: 89 Broad Street, New York City, *Bowling Green 9-7751.*



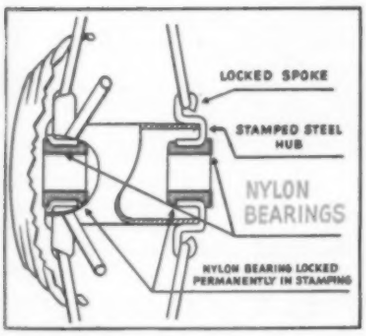
Kurz-Kasch

FOR OVER 31 YEARS PLANNERS AND MOULDERS IN PLASTICS



NYLON PLASTIC CUTS RUB IN THE HUB

Bearing of Du Pont nylon needs no lubrication . . . rolls quietly



Need bearings in your business? Why not investigate Du Pont nylon plastic? Nylon is silent . . . no squeaking, and creaking. Nylon bearings won't chip, flake or powder . . . need no lubrication when loads are light and speeds are low. In the textile industry, for example, this means no oil spots on fabrics. Nylon has proved satisfactory for bearings with walls as thin as 1/16" . . . for bearings as large as 1½" O. D. It may mean new profits for *you*.

Nylon's making news again—this time on the wheels of a baby carriage. In tests made on these wheels, bearings molded of tough, durable Du Pont nylon *actually lasted longer* than the metal axles. And they need no lubrication . . . withstand shocks and blows.

In other applications where loads are heavier, speeds are high, and lubricants are required, either oil or water can be used. Du Pont nylon plastic is not affected by oils and greases, chemicals and solvents . . . withstands service temperatures as high as 325°F. Nylon bearings show little or no deterioration with age. And injection molding permits rapid, large-scale production.

Is there a place for nylon in your business? You may profit with this and other Du Pont plastics . . . in developing a new product or improving an old one. Write now for literature. It will pay you to have it in your files. E. I. du Pont de Nemours & Co. (Inc.), Plastics Department, Room 365, Arlington, N. J.

Baby carriages manufactured by Collier-Keyworth Co., Gardner, Mass.; nylon bearings molded by Nylon Bearings, Inc., Whitman, Mass.

Listen to Du Pont "CAVALCADE OF AMERICA"
—Every Monday Night, NBC Network

DU PONT
REG. U. S. PAT. OFF.
Plastics
BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

MACHINE CONTROL Solved This Problem

Reed-Prentice Plastic Injection Machines provide for exact regulation of molding temperature and pressure!

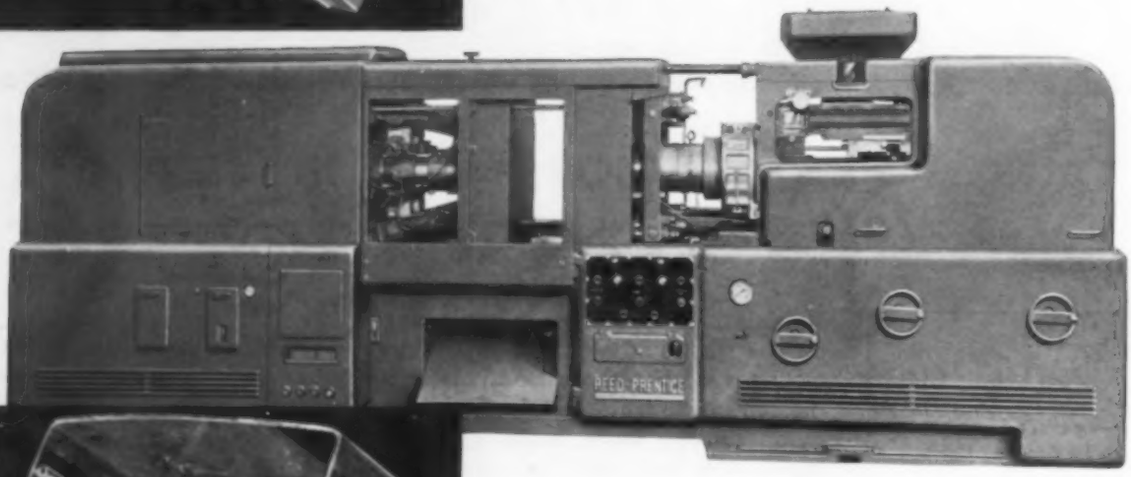
HERE'S a perfect example of the ability of Reed-Prentice molding machines to handle difficult molds, characterized by an exceptionally long draw.

This attractive radio cabinet, molded in polystyrene, on the 10H-24 Oz. machine by Ideal Novelty & Toy Co., of Hollis, N. Y., for the Bendix Radio Corporation, is a two piece assembly, each shot running on an approximate one minute cycle.

The single cavity base, molded with an open grill (see Fig. 1) and the single cavity, thin section cover (see Fig. 2), presented a problem requiring fast and complete plasticizing ability of the heating cylinder. To achieve the marble effect as shown in Fig. 2, proper blending of color and accurate control of material are necessary. The required coordination of an efficient heating cylinder and complete control of pressure on the material —up to 24,500 lbs. per sq. inch — is provided by the Reed-Prentice machine.

It will be to your advantage to learn about other important features that establish the leadership of Reed-Prentice machines in the injection molding field. For full information write Dept. D for a description of the 4, 8, 10, 12, 16 and 24 Oz. capacity models.

Figure One



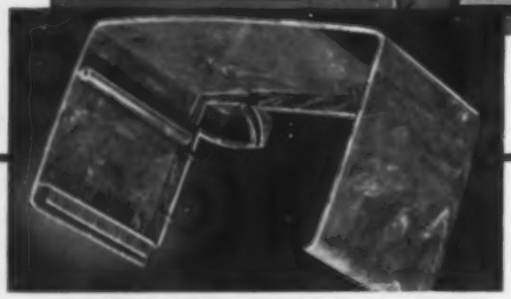


Figure Two

THE WORLD'S LARGEST MANUFACTURERS OF INJECTION MOLDING MACHINES

INJECTION MACHINES

REED-PRENTICE CORP.

WORCESTER MASS., U.S.A.

NEW YORK
75 West Street

CLEVELAND
1213 W. 3rd Street

LOS ANGELES
2328 S. Santa Fe Ave.

Ingersoll clock manufactured by U. S. Time Corporation

Give it the WORKS...

it's CELCON*

PLASTIC with these molded-in qualities and features

Clock Cases and Housings molded of tough Celcon plastic are your best insurance against consumer complaints.

Celcon is really tough — shatterproof tough and it does not attract dust. It brings to products — from clocks and electrical appliances to toys and hardware — those molded-in qualities that mean longer life and finer appearance . . . eliminates many production steps including buffing, tumbling, painting, plating, annealing.

Check with your Celanese representative. His list of recent Celcon applications in the consumer field will show how manufacturers are making full use of Celcon's properties — to turn out quality products faster and more economically.

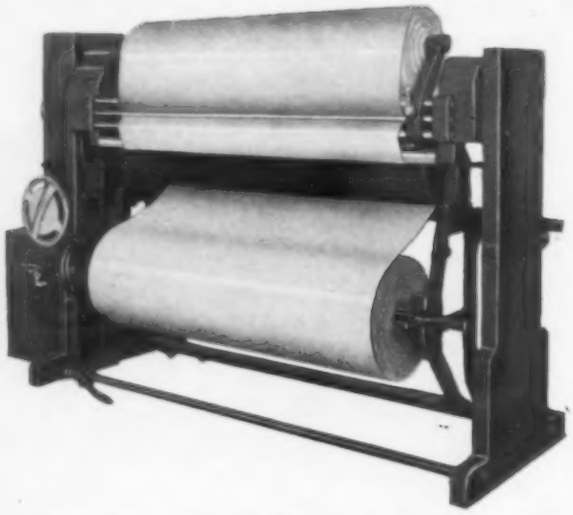
CELANESE CORPORATION OF AMERICA, Plastics Division, Dept. D-1, 180 Madison Avenue, New York 16, N.Y. *Reg. U. S. Pat. Off.

1. **Shatterproof toughness**
2. **Clear through color**
3. **Chipproof surface**
4. **Dimensional stability**
5. **Shockproof safety**
6. **Touch pleasant surface**
7. **Easy moldability**
8. **Permanent surface lustre**
9. **Raised lettering and calibrations**
10. **Sound absorbing**
11. **Does not attract dust**

LUMARITH* FORTICEL* CELLULOID* VIMLITE* CELCON*

Celanese Plastics*

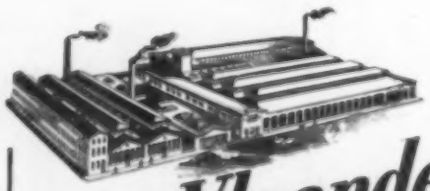
WIND FILMS and FABRICS at 200 yards per minute



The Van Vlaanderen Tubing Machine can be operated up to 200 yards per minute depending upon the type of synthetic fabric being wound. Movable carriage facilitates selvage alignment. Speed is constant at all times. An adjustable tension arrangement is provided. It can also be equipped with accurate measuring devices and interleafing attachments.

The Tubing Machine is only one of the units in the complete line of equipment which we manufacture for the textile industry. Many of these machines can be utilized without modification for processing synthetic fabrics, sheeting and film.

Send us a sample of your material and we will be glad to help solve your processing problems. There's no obligation, of course.

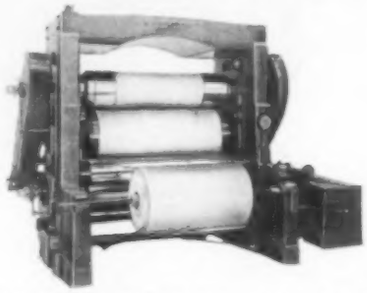


Van Vlaanderen

MACHINE COMPANY

370 Straight Street, Paterson, New Jersey

USE THESE STANDARD MACHINES FOR SYNTHETIC FABRICS



CALENDERING. Calendering machines for synthetic fabric processing are available in many different types and all tonnages. These machines work exceptionally well for chloride monofilms and Saran. All are designed for cold or hot calendering. Either steam or gas can be used for heating.

EMBOSSING. Two or three roll embossing machines are available in both male and female types. Rolls can be quickly interchanged. Made in hydraulic, lever or screw types.

BLEACHERS • BREAKERS • CALENDERS • CALENDER DRYERS • CONTINUOUS WASHERS • COOLING CYLINDERS • COTTON BACK FINISHER DRYERS—ALL TYPES • DYEING MACHINES • ELECTRIC GUIDERS • EMBOSSING MACHINES • EXPANDERS • EXTRACTORS • FLOCK PRINTING MACHINES • HEATING TOWERS • HYDRAULIC CALENDERS • IMPREGNATING MACHINES • MANGLES • MEASURING MACHINES • MIXING KETTLES • PAD DYEING MACHINES • PRINT WASHERS • ROLLING-UP MACHINES • ROLLS—RUBBER—PAPER • SINGEING MACHINES • SLACK PRINT WASHERS • SOAP WASHING MACHINES • SQUEEZERS • SUCTION MACHINES • TENSIONLESS CONSTANT SPEED DYE JIGS • TENTER FRAMES • TUBING MACHINES • WINDERS •

VARCUM PHENOL CH_2O RESINS

Make the "Brakes" with VARCUM resins!

When you make the "Brakes" with Varcum resins, you are also getting "the breaks" . . . for Varcum resins are ideal for impregnating automobile, truck and industrial linings as well as brake blocks.

Varcum resins for friction materials come in lump, liquid or powdered form for use in the dry mix, extrusion impregnating, wire back, water mix and rubber mix processes.

These resins include straight phenolic, oil modified and oil soluble types for most of these processes.

Varcum also has complete lines of phenolic resins for many other purposes. If you will send us your specifications, we will advise you which Varcum resin can do your job best.

Synthetic VARCUM Resins

VARCUM CHEMICAL Corporation

NIAGARA FALLS, N. Y.

"Your Plastics Department"

Presents **EXAMPLES OF FINE WORKMANSHIP**

#3

OF A SERIES

This thermostat housing, manufactured for the White Manufacturing Company, is molded of polystyrene material for a close fit to base of main mechanism and accurately foil embossed with temperature calibrations.

This is another proof of the "extra" service obtainable at

"Your Plastics Department"

Write Us Your Problems Today

MINNESOTA PLASTICS CORP.

INJECTION MOLDING MINCOR YOUR PLASTICS DEPARTMENT

366 WACOUTA STREET
ST. PAUL 1, MINNESOTA

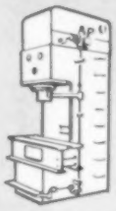
INJECTION MOLDING MINCOR YOUR PLASTICS DEPARTMENT

INJECTION MOLDING • FINISHING • ASSEMBLING • PACKAGING • PRINTING • PAINTING

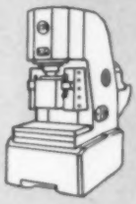
WHEREVER YOUR PRODUCTION CALLS FOR PRESSURE PROCESSING H-P-M EQUIPMENT DOES IT BETTER—FASTER—AT LOWER COST

DOUBLE-ACTION DRAWING PRESSES

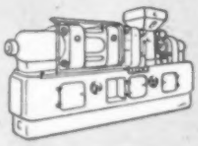
SINGLE-ACTION PLATEN PRESSES



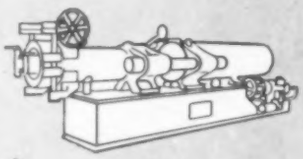
FORCING PRESSES



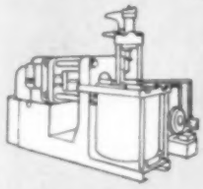
O B I PRESSES



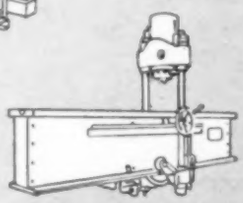
PLASTICS MOLDING MACHINES



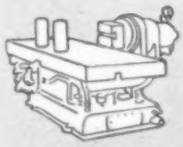
EXTRUDING PRESSES



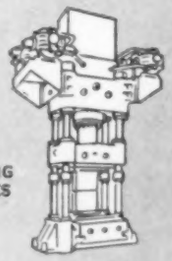
DIE CASTING MACHINES



STRAIGHTENING PRESSES



BENDING PRESSES



FORGING PRESSES

Write for
BULLETINS DESCRIBING THESE H-P-M PRESSES

Plastic Radio Cabinet Production . . . *doubled* with H-P-Ms!

This polystyrene radio cabinet was molded complete in just 88 seconds!

this is "music" to the ears of every manufacturer!

To meet a big demand for its new table model radio, a prominent radio manufacturer needed 250,000 radio cabinets "RIGHT NOW."

The General Industries Company tackled the job, and with their H-P-M 16 ounce Injection Molding Machines, were soon producing attractive radio cabinets of polystyrene in "nothing flat" and at a three-fold savings in production costs—

1 — production was doubled over conventional phenolic cabinets.

2 — costly finishing operations were eliminated.

3 — unlimited color selections of polystyrene over phenolics did away with expensive painting.

This is how one manufacturer solved his plastics production problem! Now, how about yours? You, too, can mold plastic parts faster, at lower cost with H-P-Ms. Call in a nearby H-P-M engineer or write today for more information about these money saving injection molding machines.

THE HYDRAULIC PRESS MANUFACTURING CO.
1010 **Marion Road** • **Mount Gilead, Ohio, U. S. A.**
Branch Offices in New York, Cincinnati, Cleveland, Columbus, O., Detroit, Pittsburgh and Chicago. Representatives in other principal cities.
Export Dept: 500 Fifth Avenue, New York, N. Y. Cable—"Hydraulic"

Want to know more about plastics? Write today for Bulletin 4404—an informative booklet on the fundamentals of plastics molding.

All-Hydraulic • Self-Contained
PLASTICS MOLDING MACHINES
INJECTION • COMPRESSION • TRANSFER

HPM

REVOLUTIONIZING PRODUCTION WITH HYDRAULICS SINCE 1877

TITANOX . . . *the brightest name in titanium pigments*

Photo courtesy of Pantasote Company

Plastics compounded with these titanium dioxide pigments acquire a clarity of tint that pleases the plastic compounder and molder — as well as satisfies the seller and consumer of finished products. TITANOX pigments are as effective in making plastics white as they are for making them light-colored.

They also impart a great amount of brightness. The amount of translucency can be controlled or absolute opacity given, as desired. Another advantage: products so compounded maintain all these desirable qualities permanently.

The Technical Service Laboratories of the Titanium Pigment Corporation are maintained for the purpose of providing help to customers with respect to the most advantageous and economical use of TITANOX pigments. You are cordially invited to take advantage of these facilities.

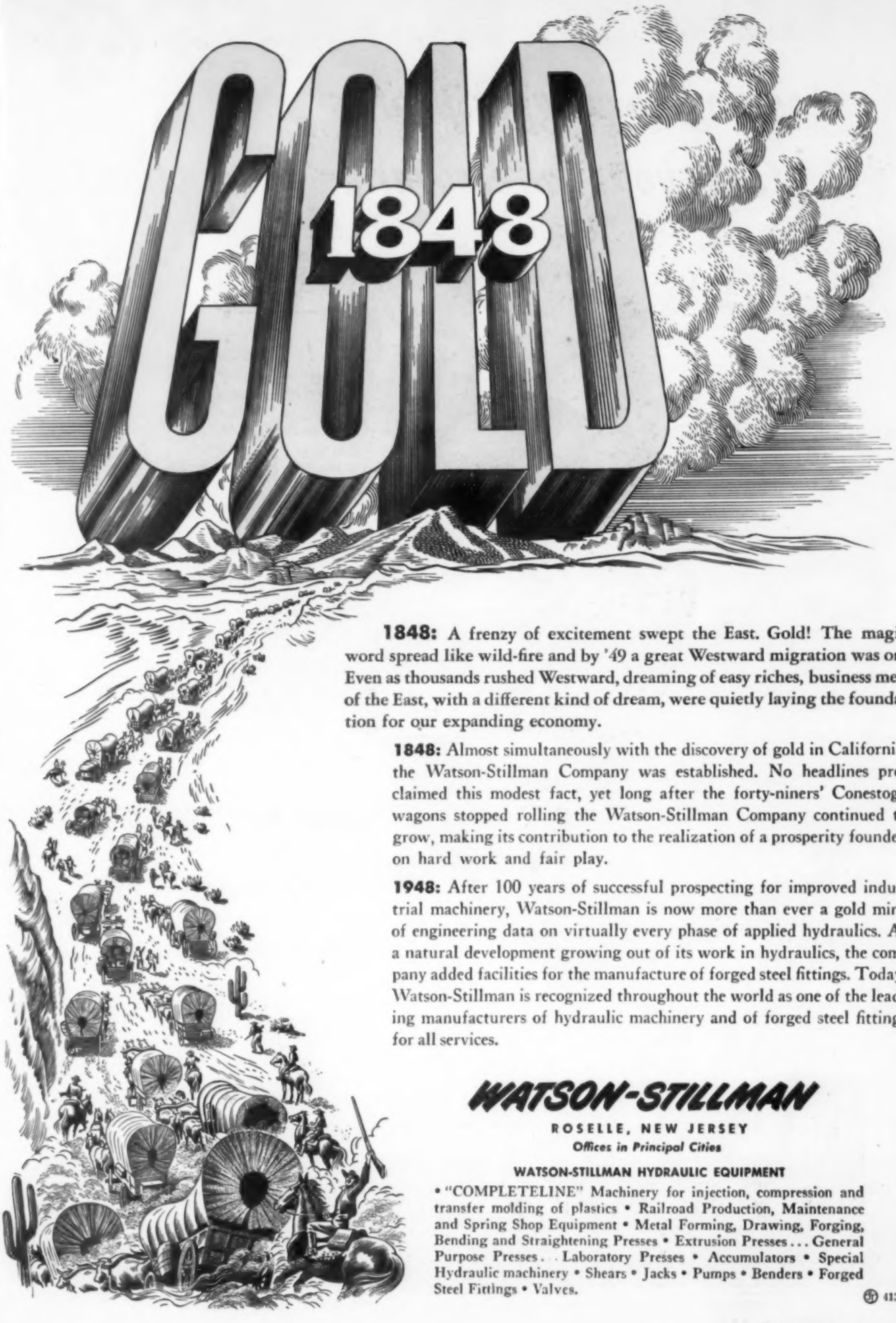
6383

TITANOX

Reg. U. S. Pat. Off.

TITANIUM PIGMENT CORPORATION
SOLE SALES AGENT

111 Broadway, New York 6, N. Y.
104 So. Michigan Ave., Chicago 3, Ill.
350 Townsend St., San Francisco 7, Cal.
2600 S. Eastern Ave., Los Angeles 22, Cal.



1848: A frenzy of excitement swept the East. Gold! The magic word spread like wild-fire and by '49 a great Westward migration was on. Even as thousands rushed Westward, dreaming of easy riches, business men of the East, with a different kind of dream, were quietly laying the foundation for our expanding economy.

1848: Almost simultaneously with the discovery of gold in California, the Watson-Stillman Company was established. No headlines proclaimed this modest fact, yet long after the forty-niners' Conestoga wagons stopped rolling the Watson-Stillman Company continued to grow, making its contribution to the realization of a prosperity founded on hard work and fair play.

1948: After 100 years of successful prospecting for improved industrial machinery, Watson-Stillman is now more than ever a gold mine of engineering data on virtually every phase of applied hydraulics. As a natural development growing out of its work in hydraulics, the company added facilities for the manufacture of forged steel fittings. Today, Watson-Stillman is recognized throughout the world as one of the leading manufacturers of hydraulic machinery and of forged steel fittings for all services.

WATSON-STILLMAN

ROSELLE, NEW JERSEY

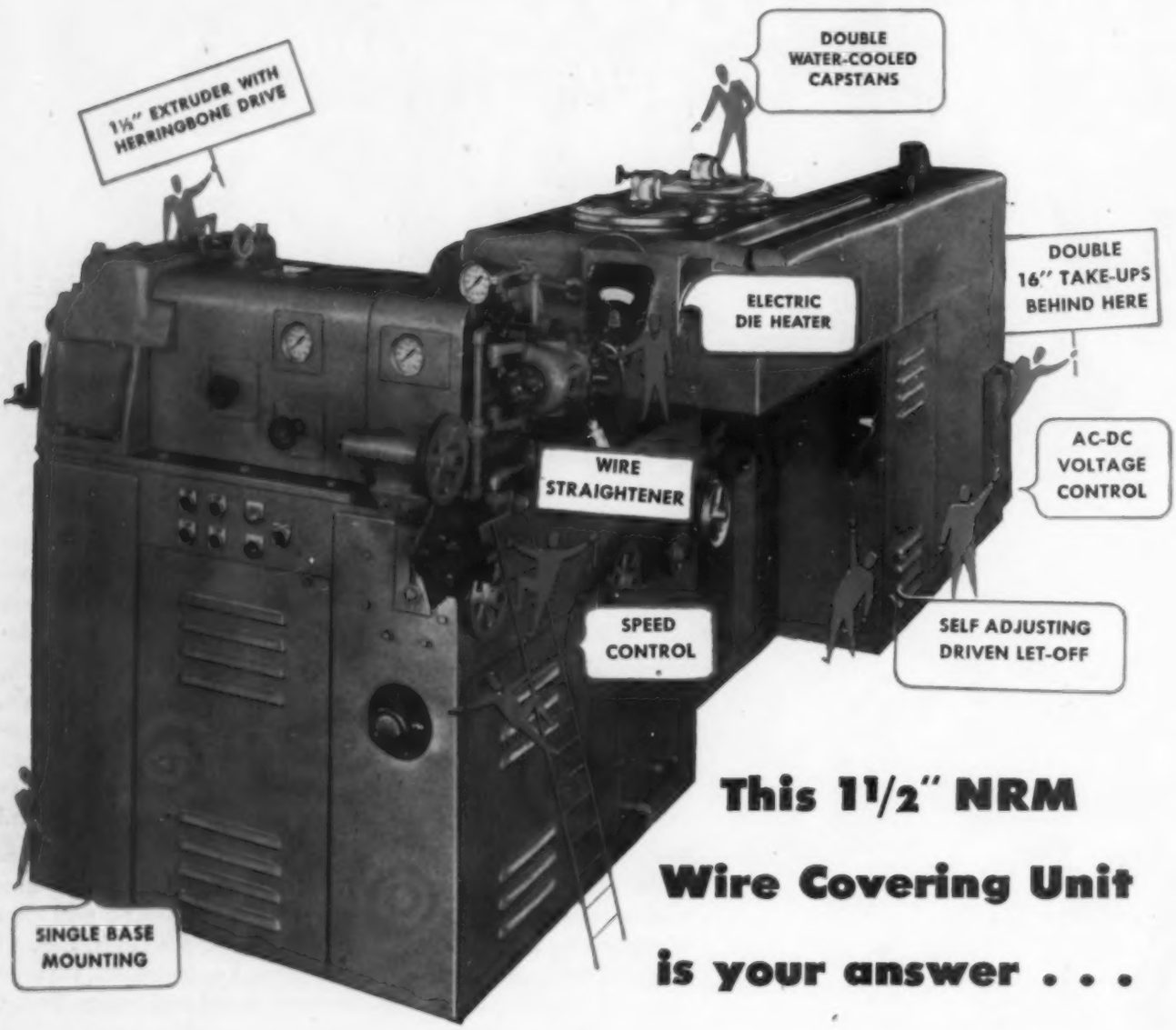
Offices in Principal Cities

WATSON-STILLMAN HYDRAULIC EQUIPMENT

• "COMPLETELINE" Machinery for injection, compression and transfer molding of plastics • Railroad Production, Maintenance and Spring Shop Equipment • Metal Forming, Drawing, Forging, Bending and Straightening Presses • Extrusion Presses . . . General Purpose Presses . . Laboratory Presses • Accumulators • Special Hydraulic machinery • Shears • Jacks • Pumps • Benders • Forged Steel Fittings • Valves.

4131

Looking for bigger profits from your wire covering production?



This 1½" NRM Wire Covering Unit is your answer . . .

● Space here is too limited to completely describe the unit above. But you can see for yourself . . . its clean, compact design . . . only 13 feet long. What you can't see is its versatility . . . its great performance on smaller diameters of wire at speeds up to 800 feet a minute. If you want to add a great little unit to your wire covering capacity, you'll need more information of course . . . just drop us a line, today.

NRM

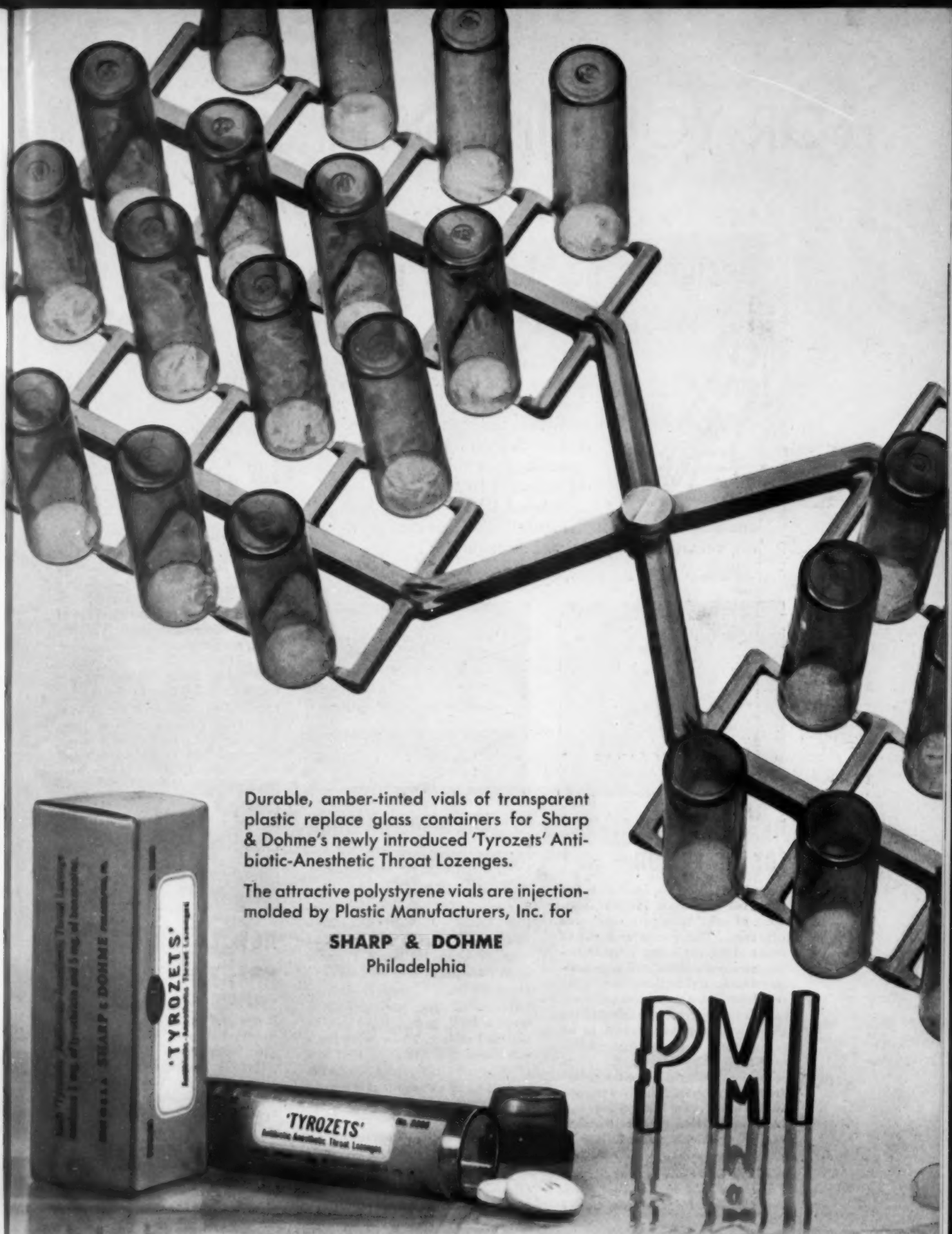
NATIONAL RUBBER MACHINERY CO.

General Offices: AKRON 8, OHIO

California Representative: Sam Klipp, P. O. Box 441, Pasadena 18, Calif.

Plastics MACHINERY DIVISION

EXPORT DISTRIBUTORS: OMNI PRODUCTS CORPORATION, 460 FOURTH AVE., NEW YORK 16, N. Y.



Durable, amber-tinted vials of transparent plastic replace glass containers for Sharp & Dohme's newly introduced 'Tyrozets' Antibiotic-Anesthetic Throat Lozenges.

The attractive polystyrene vials are injection-molded by Plastic Manufacturers, Inc. for

SHARP & DOHME
Philadelphia

PMI

PLASTIC MANUFACTURERS

INCORPORATED

STAMFORD CONNECTICUT

INJECTION • TRANSFER & COMPRESSION MOLDING • COMPLETE ASSEMBLY

FOR YOUR INFORMATION

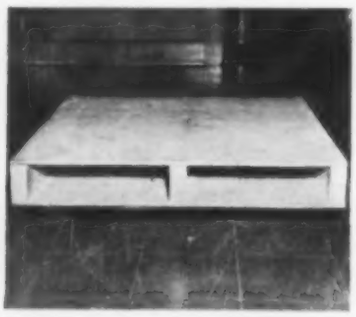
Designers develop new uses for versatile plastics

Monsanto plastics are constantly being "stretched" to include new properties and new uses through the work of research. The phenomenal growth of the plastics industry is reflected in the increasing number of new applications and new designs which capitalize on this ever growing versatility of plastics. For example:

new applicator for dairymen

Unusual new use for Lustron is the Nox-Trol applicator for the treatment of cows' teats with medicated ointment. The pump and wiper blade of the applicator provide faster, more economical, and more sanitary treatment than possible with the usual hand method. Lustron, Monsanto's polystyrene, was selected for the bowl and pump because of its transparency and because easy molding makes extra machining, finishing and assembly steps unnecessary. Lustron is especially advantageous in this use because it withstands corrosive actions of chemicals and is easily and quickly cleaned.

(Nox-Trol Applicator by American Molding Co., 355 Fremont St., San Francisco. Sold by Nox-Trol Products Co., Box 161, Stockton, Calif.)



RESINOX gives plywood longer useful life

The useful life of plywood increases as much as ten times in Kimberly-Clark laminated overlays using Resinox resins. The re-use of plywood concrete forms, for instance, jumps from a normal of about ten times to about 100 times . . . through Resinox impregnated paper laminates which form a hard, tough, non-checking plywood surface. The overlay laminates, also used for grain bins and similar applications, minimize moisture and abrasion...give proved resistance to solvents, water and heat. The Resinox resins are widely used to laminate, impregnate or bond materials such as paper, cloth, fibers and abrasive grains.

(Resinox-impregnated pallet resists rough handling in factory use)

for hot or cold... a LUSTRON bucket

This three-quart Lustron bucket is ideal . . . both as an ice container and hot food thermos. It takes more than 18 hours for a full bucket of ice to melt completely at room temperatures. The bucket makes good use of Lustron's increasing strength at lowering temperatures. Tasteless, odorless and easily cleaned, the buckets with tightly fitting, transparent covers, are molded in many colors.

(Molded by Majestic Molded Products, Long Island City, New York, for Brrr Inc., 1785 First Avenue, New York, N. Y.) Resinox: Reg. U. S. Pat. Off.

new LUSTREX plug easily assembled

This electric plug's removable sealing insert allows withdrawal of prongs for quick connections . . . then locks prongs inside the plugs to prevent wires from touching and short circuiting. The plug body is molded of heat-resistant Lustrex and the sealing plug of versatile Lustron polystyrene.

(Molded by National Products Company, 6100 Wilson Avenue, Kansas City, Mo. Sold by Sta-tite Manufacturing Company, 1016 Central St., Kansas City, Mo.)

News about Plastics from Monsanto Chemical Company

MAY... 1948

Monsanto expands phenolic output, builds own raw material sources

Building of formaldehyde and wood flour production units plus phenol plants, is making Monsanto independent of outside sources for the basic raw materials for phenol-formaldehyde molding compound and industrial resins. Molders and laminators are thus assured of steady Resinox production uninterrupted by raw material shortages.

Already one of the nation's three largest phenol producers, Monsanto's addition of formaldehyde production will be undertaken in a new plant at Monsanto's Plastics Division in Springfield, Massachusetts. Wood flour is already being produced in the recently completed Springfield installation. The entire expansion program will be completed this summer.

Monsanto Resinox production is being geared to present markets and to new markets being opened by advanced engineering and design. Large moldings up to 12 pounds are being made and moldings over five pounds are becoming common. New applications for industrial resins are also being developed rapidly in many fields.

Molders, laminators and fabricators . . . and end users of plastics generally . . . can always get advice from Monsanto's Technical Council which meets regularly to help solve plastics producers' problems. In addition, a complete Monsanto advertising and sales promotion program is available to help molders move goods. The convenient coupon will bring full information on Monsanto's Resinox . . . Monsanto's Family of Plastics . . . and Monsanto's sales cooperation program.

RESINOX telephone for Marshall-Field

Resinox, Monsanto's tough, durable thermosetting phenolformaldehyde plastic has an ideal application in the new green telephones installed throughout Marshall-Field's department store in Chicago for credit department communication. Sales personnel in the store can get an immediate credit report on any customer by lifting the green telephone which connects directly with the credit department. Made by the Western Electric Company, the telephones illustrate the strength and durability of Resinox and show how even standard plastics can, with imaginative design, create new interesting uses. Lustron: Reg. U. S. Pat. Off.

LUSTRON leads in lighting

Lutron's qualities: Light weight, high refractive index, shatterproof, translucence, easily molded in large sections, are used in this Leader light fixture molded by Bernard Edward Company, Chicago.

MONSANTO
CHEMICALS — PLASTICS

SERVING INDUSTRY...WHICH SERVES MANKIND

USE THIS COUPON TO BRING YOU PROMPTLY FULL INFORMATION ON MONSANTO PLASTICS

MONSANTO CHEMICAL COMPANY, PLASTICS DIVISION
Dept. MPLP 5, Springfield 2, Mass.

Please send me information on ☐ General (12 basic Monsanto Plastics) ☐ Lustron ☐ Lustrex ☐ Resinox ☐ Monsanto's sales cooperation program.

Name _____ Title _____

Firm _____

Address _____

City _____ State _____

"Heard his story about Fiberglas*-reinforced plastics?"

He's saying that with Fiberglas reinforcements you can design and produce a laminated product that is:

Light in weight and extremely tough

Resistant to corrosion and rust

Permanently colored: Eliminates original cost of surface finishing—no maintenance cost.

Easy to fabricate: Can be formed with either high or low-pressure laminating equipment—at minimum tooling cost.

Economical: Fiberglas reinforcements are available, today, priced lower than most commonly used laminating reinforcing materials.

Want to know more about these materials and processes that can help you expand your markets and lower your fabricating costs on complete finished or component parts? Then write today for a copy of "Fiberglas-Reinforced Plastics" Manual A9.3.1. It contains information on the properties, applications, economics and typical methods used in fabricating products of plastics reinforced with Fiberglas Mats, Cloths and Fibers . . . Owens-Corning Fiberglas Corporation, Dept. 876, Toledo 1, Ohio. Branches in principal cities.

In Canada: Fiberglas Canada Ltd., Toronto, Ontario.

*Fiberglas is the trade mark (Reg. U.S. Pat. Off.) for a variety of products made of or with glass fibers by Owens-Corning Fiberglas Corporation.

OWENS-CORNING

FIBERGLAS

REG. U.S. PAT. OFF.

PLASTICS REINFORCEMENTS

Molded right for writing

Our molding assignment for these Alexander pencils was to produce writing instruments properly balanced—smooth of line. Color specifications were carefully met—functional needs of the product were painstakingly watched.

This careful consideration of functional needs characterizes our production activity. First we determine whether or not plastics can do the best job for you. Then we make sure *in advance*, that the plastic material used will be *right* for your product. Our engineers and molders now go to work and create a plastic product that is *right* every way you look at it. *Right* for appearance—*right* for stability—*right* for sales appeal.

We'd like to convince you in person that ours is the *right* molding service for you. Tell us about your plastic problems. You'll receive a speedy and, we believe, a helpful and profitable answer.

Write on your letterhead for the new injection Molded and Extruded Plastics catalogue. Or, for detailed information about CHILO PLASTICS* pipe, tubing and fittings, write for circulars containing data and illustrations.

ELMER E. MILLS CORPORATION

INJECTION MOLDERS and EXTRUDERS of: Tenite, Lumarith, Plastacele, Fibestos, Lucite, Plexiglas, Nylon, Polystyrene, Styron, Lustron, Loalin, Vinylite, Geon, Flexene, Polyethylene, Cerex, Forticel, CHILO PLASTICS*, Saran, and other Thermoplastic Materials.

153 WEST HURON STREET • CHICAGO 10, ILLINOIS

Plastic Colors for... *by Ferro*

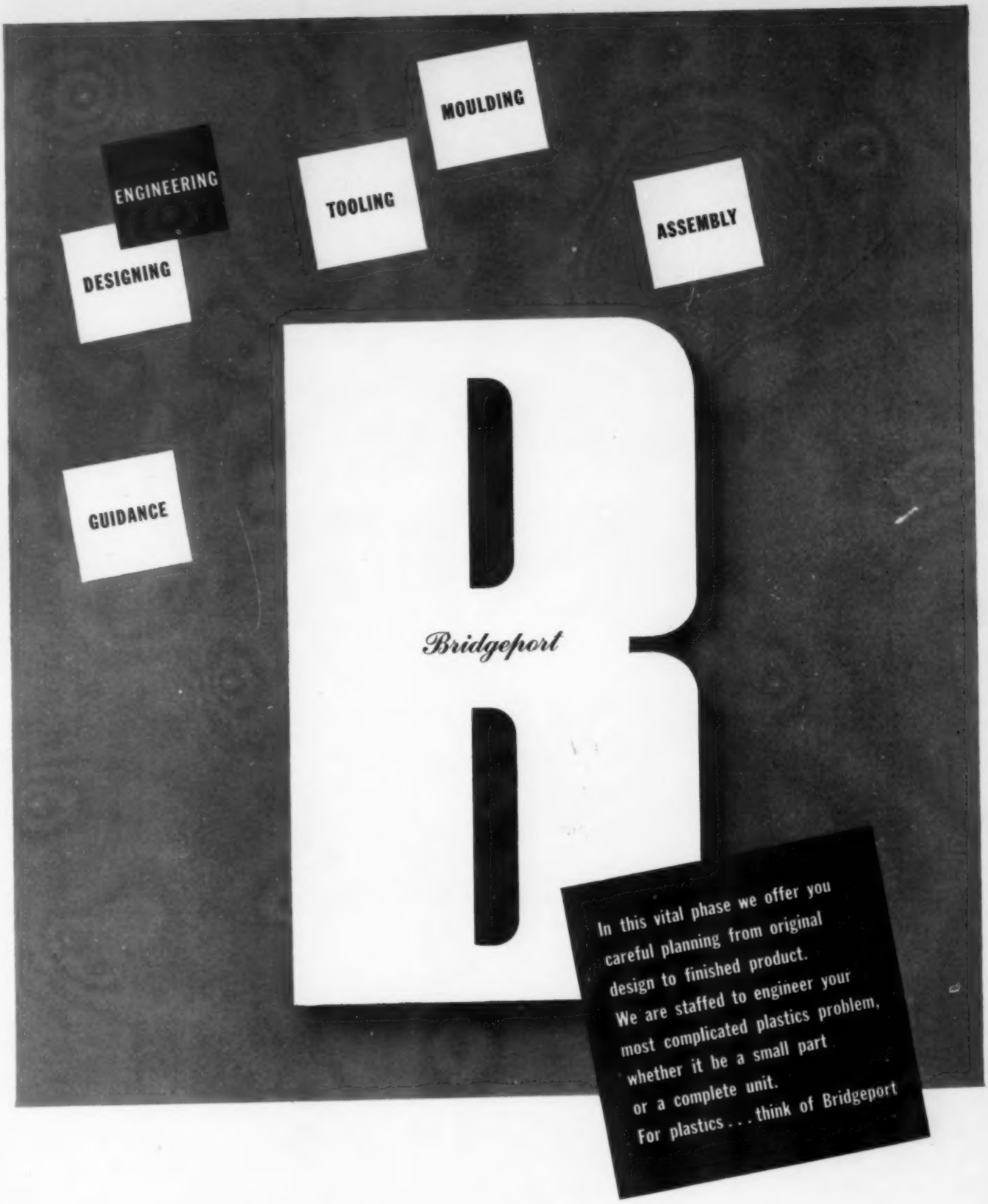
Ferro's newly developed inorganic colors offer an unusual combination of desired color properties for injection, extrusion and compression molded plastics.

For example, Ferro colors (red, yellow, blue, green, brown and black) are highly stable in temperatures up to 2300° F. They are easy to work and have an unusually low bulking value. Electrical and chemical-resistant, these uniform colors are also light-fast . . . unaffected by weather extremes . . . nonbleeding and nonmigrating in chemical neutral plastics.

If you, as a producer of plastics or as a manufacturer of plastic products, are not satisfied with your present colors—we suggest you explore the possibilities of these newly developed inorganic colors by Ferro. Complete information will be gladly furnished on request.

FERRO enamel corporation • COLOR DIVISION

4150 East 56th Street • Cleveland 5, Ohio



BRIDGEPORT MOULDED PRODUCTS, INCORPORATED

BRIDGEPORT CONNECTICUT

AT HOME OR AWAY,
AT WORK OR PLAY...

Cellulosics Save and Sell

Attractive, durable nitrocellulose plastic is used in the manufacture of the toilet articles for this man's dressing kit. Nitrocellulose plastic is extremely resistant to cracking and chipping, and easily fabricated.

FABRICATED BY JOSEPH DAVIS PLASTIC CO.

Beautiful pearls of cellulose acetate plastic are light in weight, comfortable to wear, and practically unbreakable. Each bead has perfect dimensions, with the hole centered and exact in size.

EXTRUDED BY KEYSTONE PLASTICS
MOLDING POWDER SUPPLIED BY KOPPERS
FABRICATED BY ORANGE MACHINE PRODUCTS, INC.

he dimensional stability and toughness of improved ellulose acetate formulations are being utilized to old housings for office communication sets and for auto grilles.

Molded from a new cellulose acetate formulation, the Acme-Lite Bed Lamp offers beauty, safety, and utility all in one unit. The dimensional stability, lustrous finish, and toughness of this plastic afford lengthy service.

MADE BY ACME-LITE PRODUCTS CO.
MOLDED BY BOONTON MOLDING CO.

The lightweight "Reddylite" lantern is molded of ethyl cellulose plastic, affording unusual strength and durability to the product. Ethyl cellulose plastic is tough over a wide range of temperatures without being brittle.

MOLDED BY DELTA ELECTRIC COMPANY.
MOLDING POWDER SUPPLIED BY KOPPERS

parkle Plenty," favorite doll of millions of American hildren, is the favorite of parents, too, because its thyl cellulose plastic head has outstanding impact esistance and toughness.

New, modern design Fuller brushes have cellulose acetate plastic backs and handles because its toughness cuts down breakage loss in manufacturing; also, toughness plus beauty pleased the customers.

MADE BY FULLER BRUSH CO.

Dress up your kitchen and linen shelves with "Superlon," the washable, long-wearing cellulose acetate plastic shelf trim. "Superlon" can be obtained in seven gay colors, and is resistant to tearing, sagging, and fading.

SHELF TRIM MADE BY SUPERIOR PLASTICS DIVISION.

New multiple-color extrusions of Lumarith, cellulose acetate plastic, are being used as fluorescent light shields. Extrusions have permanent molded-in colors; are obtainable in wide variety of color combinations.

EXTRUDED BY SCHWAB AND FRANK, INC.;
MOLDING POWDER, "LUMARITH," SUPPLIED BY CELANESE.

Cellulose acetate laminates are finding increased applications. This thermos bottle carrying case is lightweight, sturdy, and attractive. Other uses for laminates already on the market include suitcases.

MADE BY CLARK LEATHER PRODUCTS COMPANY.

This colorful, table-model radio has a cabinet of ethyl cellulose plastic, one of the toughest plastic materials. Ethyl cellulose plastic is outstanding for its dimensional stability and resistance to impact.

MOLDED BY CHICAGO DIE MOLD CORP.;
MOLDING POWDER, "CELCON," SUPPLIED BY CELANESE.
RADIO MADE AND DISTRIBUTED BY GENERAL TELEVISION AND RADIO CORP.

Ethyl cellulose plastic's outstanding combination of toughness, dimensional stability and lightweight is utilized in two compact, attractive Western Electric hearing aids.

HOUSING MOLDED BY ERIE RESISTOR CORP.
KNOBS MOLDED BY WATERTOWN MANUFACTURING CO.;
MOLDING POWDER SUPPLIED BY KOPPERS.

Cellulose acetate plastic fish lures demonstrate the toughness, dimensional stability, and adequate moisture resistance of this plastic. Metal inserts are firmly anchored.

MOLDED BY DILLON-BECK CO.

Cellulose acetate plastic's durability, lightweight, and color are utilized in many toys—especially those that must take hard knocks without breaking. This car is molded in three different colors.

MOLDED BY ELMER E. MILLS CORPORATION;
MOLDING POWDER, "LUMARITH," SUPPLIED BY CELANESE.

The "Lazy-Lite" bed lamp turns on when you touch either end of the lid—and turns off the same way. Its colorful, streamlined housing is molded from attractive, tough, durable cellulose acetate plastic.

MOLDED BY HUNGERFORD PLASTICS CORPORATION.

These sanitary extruded cellulose acetate plastic crib rims are easy to put on, can be obtained in pink, blue, and white, and are easy to keep clean.

EXTRUDED BY H. D. WERNER CO.;

For a detailed summary of the unusual *combination* of properties you can get with the cellulosics, and for helpful technical literature on the Hercules base materials from which these thermoplastics are made, write to:

HERCULES POWDER COMPANY

916 Market Street. Wilmington 99, Delaware

HERCULES

Cellulose Acetate

Ethyl Cellulose · Nitrocellulose

CP8-7

1868-1948
CELLULOSE NITRATE
THE
VERSATILE
PLASTIC

TOUGH
BUT EASILY FORMED

NIXON C/N (Cellulose Nitrate) is easily formed and shaped into such various products as bait boxes, hosiery forms, fountain pen barrels, etc. It lends itself to such operations as cementing and machining. It is dimensionally stable and retains the form into which it has been shaped. It resists ink and moisture and is exceptionally durable. NIXON C/N is available in Sheets, Rods, Tubes, and Extruded Shapes, in a practically unlimited color range. They may be printed or engraved with decorative designs and lettering. Other NIXON Cellulosics which may be of interest to you include NIXON C/A (Cellulose Acetate) and NIXON E/C (Ethyl Cellulose). These are also offered in the same forms and, in addition, they are available in Molding Powders.

NIXON
C/N
CELLULOSE
NITRATE

NIXON NITRATION WORKS • NIXON, NEW JERSEY

Representatives: New York, Chicago, Detroit, St. Louis, Leominster • Sales Agents: NORTHWEST PLASTICS INDUSTRIES: Portland, Oregon; Seattle, Washington
Canadian Distributors: CRYSTAL GLASS AND PLASTICS, LTD. Toronto, Can. • Export Distributors: OMNI PRODUCTS CORP., 460 4th Ave., N. Y. 16, N. Y.

The Improved
VAN DORN Plastic Press

1. *Spreader* added to heating cylinder cuts heating cycles up to 50%.
2. *Hard Chrome Plating* of interior of cylinder cuts resistance to flow of materials, protects against corrosive compounds.
3. *New Relief Valve*—set at 1500 P.S.I.—insures maximum clamping pressure always, permits *separate* adjustment of injection pressure.
4. *New Needle Valve* increases gage life, by allowing gage to be shut off except for periodic checks on pressure.

★ ★ ★

With the addition of these four new features, this Van Dorn Press is *unequalled* in the 1 oz.-capacity class for molding practically all thermoplastics including nylon. This remarkably economical press—

Costs under $2000

Operates 8 hours for under a dollar

Uses less expensive molds

Can be set up by one man in 20 minutes

This Van Dorn Injection Press is unexcelled for profitable production of small parts, and "pilot" or experimental runs on bigger jobs.

We make mold bases for Van Dorn Presses.

THE Van Dorn IRON WORKS CO.
2687 EAST 79th STREET · · CLEVELAND 4, OHIO

FREE BULLETIN tells all the facts. *Write for it.*

DURITE

★ *FAST CURE*
★ *LUSTROUS APPEARANCE*
★ *RESISTANCE TO HEAT*
★ *ADEQUATE INSULATION*
★ *SATISFACTORY STAKING*

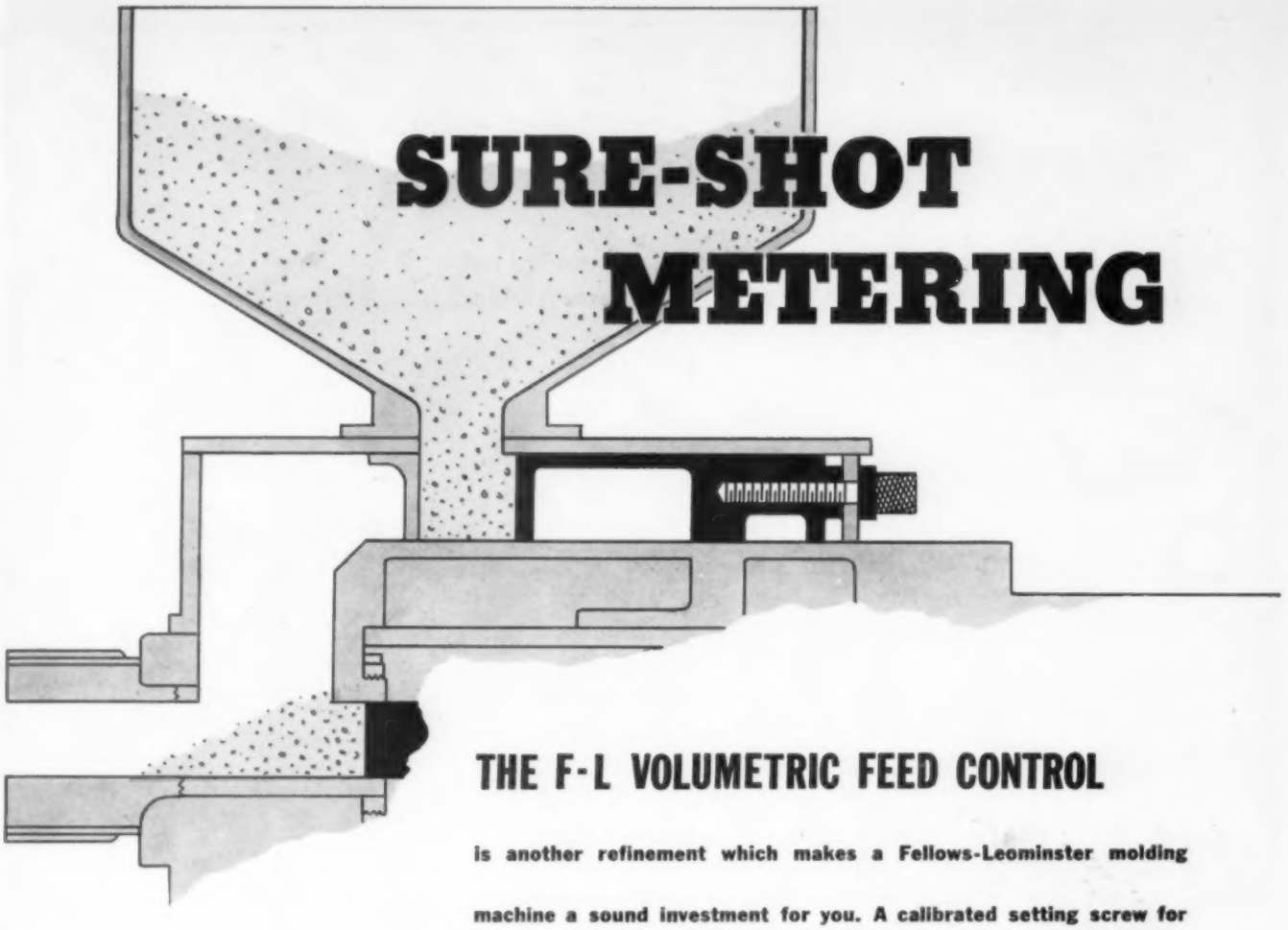
These desirable qualities, normally present in DURITE Phenolic compounds, are imparted to radio tube bases as well as to a wide variety of other applications.

DURITE PLASTICS

DIVISION OF THE BORDEN COMPANY

5000 SUMMERDALE AVE., PHILADELPHIA 24. PA.

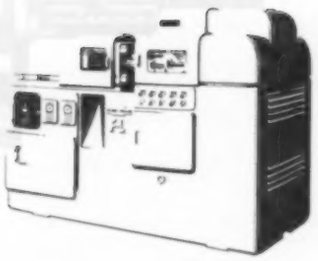
SURE-SHOT METERING



THE F-L VOLUMETRIC FEED CONTROL

is another refinement which makes a Fellows-Leominster molding machine a sound investment for you. A calibrated setting screw for fine adjustment of plastic feed gives a reliable index for subsequent production runs. It's of particular advantage with finely ground materials. Again, Fellows-Leominster hinges the hopper for simple access to the meter slide for quick cleaning in changing materials.

It's only one of many design advantages of F-L "Speed-Flo" molding explained in a bulletin available at our nearest office.



Fellows

LEOMINSTER

injection molding equipment

THE FELLOWS GEAR SHAPER CO., Plastics Machine Division. Head Office and Export Dept., Springfield, Vermont. Branch Offices: 616 Fisher Bldg., Detroit 2; 640 West Town Office Bldg., Chicago 12; 7706 Empire State Bldg., New York 1. New England Distributor, Leominster Tool Co., Leominster, Mass.

This takes 8 seconds . . .

That's the average time required to install a threaded nut, lock washer and screw, using a power screwdriver.

This takes 5 seconds . . .

A savings of 37½% in time—because no lock washer is needed—no wrench is ever required! SPEED NUTS* start easier, pull down faster.

NOTE: Figures based on study conducted by independent time-study engineers.

The stop watch tells the story. Flat-type SPEED NUTS can be applied much faster than threaded nuts and lock washers. This time-savings can mean real dollar-savings in your assembly costs.

Time-saving is a primary feature of the entire SPEED NUT System of Fastenings. Push-On type SPEED NUTS zip over unthreaded studs. SPEED CLIPS snap into position. SPEED CLAMPS combine several parts into one for quick installation.

Here's an example of proved savings: A leading vending machine manufacturer has reduced his assembly costs 25% with the SPEED NUT brand of fasteners. *Your* specific fastening problems may be answered in a comprehensive analysis prepared by Tinnerman engineers. Write for details on this service, and for your copy of the new SPEED NUT bulletin. TINNERMAN PRODUCTS, INC., 2038 Fulton Rd., Cleveland 13, Ohio.

In Canada: Dominion Fasteners Limited, Hamilton
In England: Simmonds Aerocessories, Ltd., Treforest
In France: Aerocessoires Simmonds, S.A., Paris

TINNERMAN *Speed Nuts*

® Trade Mark Reg. U. S. Pat. Off.

FASTEST THING IN FASTENINGS — MORE THAN 4000 SHAPES AND SIZES

MOSINEE

"More than Paper"

To the plastics industry, MOSINEE stands for paper-base processing materials with scientifically controlled chemical and physical properties, quality and uniformity . . . high tensile and tear strength with high absorptive capacity.

Other technical characteristics are controlled to meet specific plastics production requirements.

MOSINEE PAPER MILLS COMPANY • MOSINEE, WIS.

"Essential Paper Manufacturers"

Open THE DOOR TO *Plus* SALES

The *glowing* bar of this bell push button is easily seen in the dark, a feature that always appeals to buyers. Molded for the Trine Manufacturing Corp., of phosphorescent Styron (Dow Chemical Co.).

Another Manufacturer Adds Sales Appeal to His Product by Making it *Luminous*

BY MAKING the bar of this doorbell button of "luminous" plastic, the Trine Manufacturing Corp., added another selling feature to its product. It already had two: (1) attractive design and (2) "rocking contact". The third—"it glows in the dark"—gave this item the needed additional sales appeal to "open the door" to increased sales • • • Perhaps you, too, have a product that can be made easier-to-sell by making it easier-to-find in the dark—or, you may have a *new* product in mind where plastics that glow† will be a natural. Let us give you the benefit of our experience.

†Names of suppliers of "luminous" plastics will be sent on request.

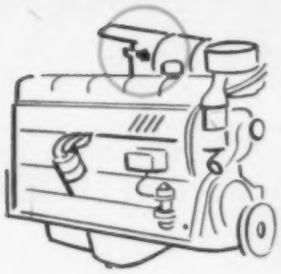
* Reg. U. S. Pat. Off.

HORSE HEAD PRODUCTS

THE NEW JERSEY ZINC CO. • 160 Front Street, New York 7, N. Y.

It's Horse Head* Luminescent Pigments *that MAKE these Plastics "Glow"*

This Contrast in Applications . . . Demonstrates



PRP

Production "Know-How"

An intricate, multi-cavity, metal-insert plastic part—an electric switch developed for a new-type automobile carburetor assembly. P R P ingenuity devised a method of handling the complicated inserts and of eliminating flash on the contact surfaces of the inserts which made the moulding of this piece particularly difficult.

Automatic machine-molded timer knob, crumb tray handle, indicator dial and feet for the base are the P R P produced plastic parts for this well-known toaster. These parts have been proven of utmost importance, both appearance-wise and functionally, to the success of this new toaster.

PRP

PLASTICS RESEARCH PRODUCTS

Production of plastic parts at P R P runs the gamut of extremes—as shown here. On scores of consumer products—appliances, for example—some of the nation's leading manufacturers turn to P R P for the production, in million units, of knobs, handles, working parts, trim. Similarly, industries in many other fields depend on P R P for research, engineering, and economical production assistance in the development of new, advanced parts . . . or in the improvement of old.

Wizardry? We attribute it rather to a broad and sound experience in plastics, to diversified, modern facilities, and to our ability to step in and PRODUCE when other means and methods fail.

P R P's dependable production and delivery can help you in your operation—today and tomorrow. Write for details.

PLASTICS RESEARCH PRODUCTS COMPANY

FACTORY AND OFFICE, URBANA, OHIO

BRANCH OFFICES: 551 Park Avenue West, MANSFIELD, OHIO
National Bank Building, LOGANSPORT, IND.

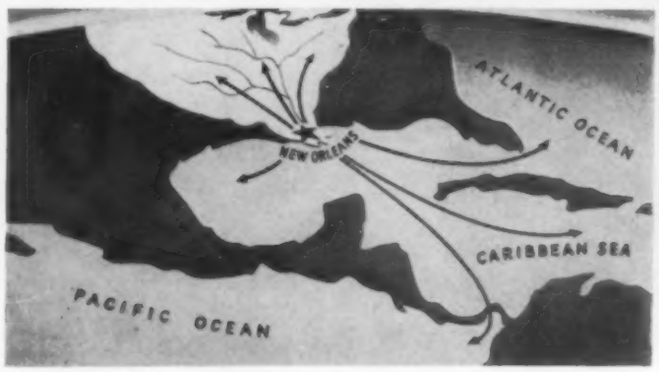
COMPRESSION, TRANSFER, HIGH SPEED PLUNGER AND AUTOMATIC MACHINE MOULDING

NEW ORLEANS WELCOMES THE PLASTICS INDUSTRIES!

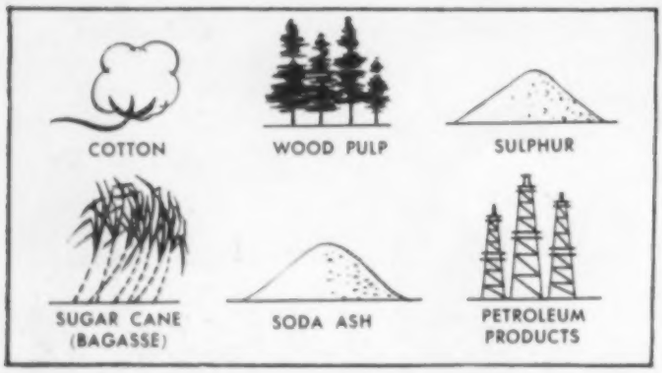
WHERE CAN YOU FIND A BETTER NEW PLANT LOCATION THAN NEW ORLEANS?

This port city gives you the three essentials for profit—

New Orleans offers an unsurpassed combination of transportation facilities for moving your products. From its fine harbor go ships to all world ports, and the city is also served economically by rail, motor truck, air and inland waterway systems.



Gateway between the vast Mid-Continent area, Latin America and the world, New Orleans has become known as the "International City". Its International House, International Trade Mart and Foreign Trade Zone provide unique facilities that aid all manufacturers and shippers. New Orleans itself is your leading Deep South market.



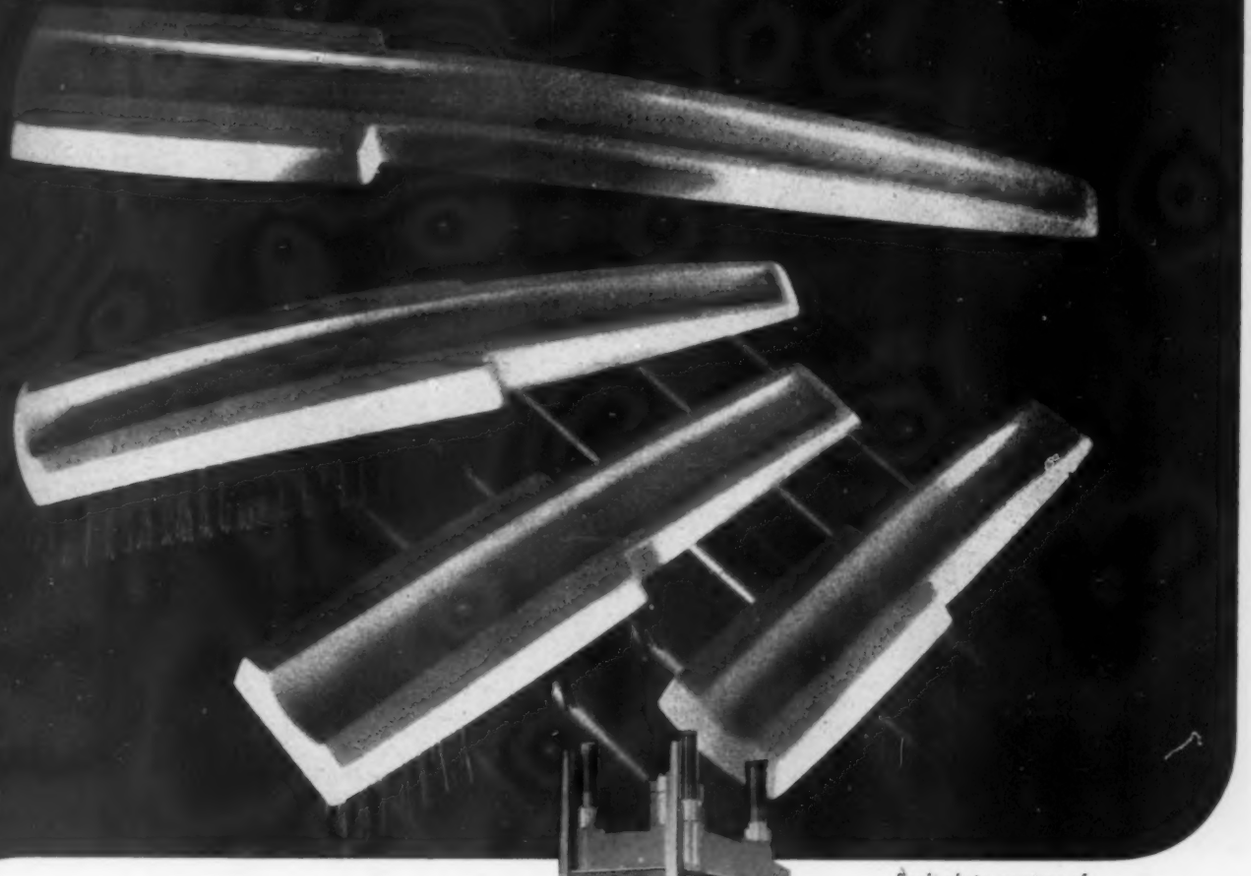
Raw materials for plastics abound in the near-New Orleans area. In addition to those pictured here, soya beans, cellulose, lignite, carbon black, the acids, etc., are produced close by. Other needed materials are imported regularly through New Orleans.

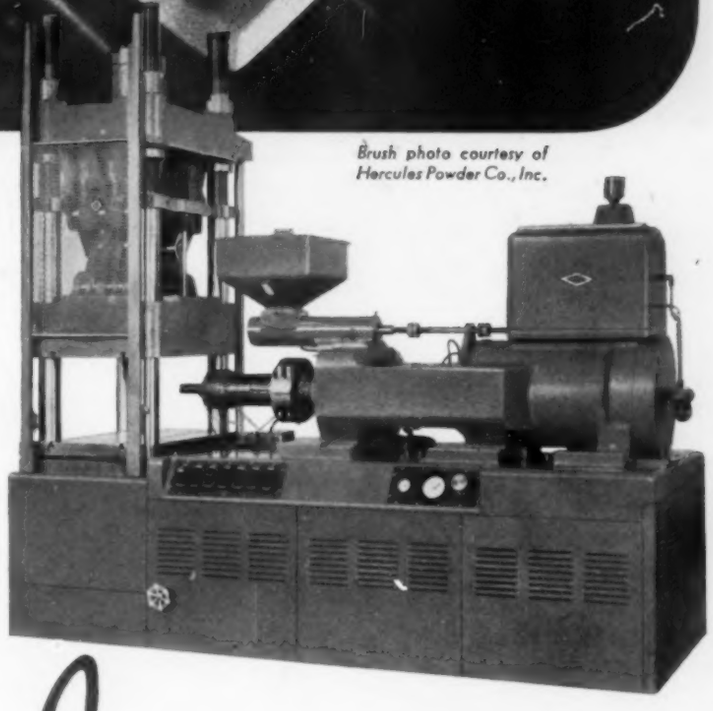
SEND FOR YOUR COPY

of our industrial study, "Manufacturing Opportunities in Plastics in New Orleans". Learn the full story about our greatly augmented supply of skilled labor, our healthful climate, our varied recreational facilities, and Louisiana's 10-year tax exemption plan for new industries. At your request, our representative will call on you. Address: Dept. 52-B Greater New Orleans, Inc., 1024 Maison Blanche Bldg., New Orleans 16, La.

GREATER NEW ORLEANS

IMPCO MACHINES on the job for Fuller Brush





Brush photo courtesy of Hercules Powder Co., Inc.

More and more nationally known products are being produced on Impco machines. Because they are sticklers for quality and economical production, we are proud to add the name FULLER to our growing list.

The Impco VF 822A machine is used by Fuller Brush. This is an unusually versatile machine. It may be used for (1) Straight injection molding of thermoplastic materials, (2) Injection-Compression molding of thermoplastic materials, (3) Compression molding of thermosetting materials, (4) Plunger or Transfer molding of thermosetting materials.

The Impco line also includes machines for straight injection and for plunger or transfer molding.

Our representative will gladly recommend a machine that meets *your* exact requirements.

MP-11

Impco

PLASTIC MOLDING MACHINERY DIVISION

Improved Paper Machinery Corporation

Nashua, New Hampshire

BIG CAPACITY PUMPS **FOR VACUUM**

OF ONE-BILLIONTH OF AN ATMOSPHERE

AMERICAN production is discovering startling ways to use high vacuum. Commercial applications in the broad fields of electronics, metallurgy, physical chemistry and nuclear physics are demanding large capacity pumps and components for fast, large-scale production.

To provide the necessary equipment, DPI's engineering department has developed a wide variety of diffusion pumps of rugged, all-metal construction capable of pumping many thousands of cubic feet per minute without sacrificing low ultimate vacuum achieved by the finest laboratory apparatus. This line of large-capacity, high-vacuum equipment and the technical knowledge acquired by DPI research men and engineers are available to industries interested in the possibilities of high-vacuum processing—or in improving present high-vacuum installations. Write:

DPI
HIGH VACUUM RESEARCH AND ENGINEERING

Vacuum Equipment Division

DISTILLATION PRODUCTS, INC.

779 RIDGE ROAD WEST • ROCHESTER 13, N. Y.

570 Lexington Ave.
New York 22, N. Y.

135 So. La Salle St.
Chicago 3, Illinois

Manufacturers of Molecular Stills and High-Vacuum Equipment; Distillers of Oil-Soluble Vitamins and other Concentrates for Science and Industry

TIME-SAVERS ON THE ASSEMBLY LINE

FOR MANY A MANUFACTURER, parts and sub-assemblies of Taylor Laminated Plastics save time on the production line . . . because they can be fabricated with such precision that inspection is speeded, rejects reduced, and assembly accelerated.

Are you interested in making your own parts of Phenol Fibre, Vulcanized Fibre, or special laminates? Taylor can supply you with sheets, rods, or tubes . . . and with helpful assistance in fabrication.

Are you seeking a dependable source of supply for parts fabricated to your specifications? Taylor's Fabricating Service is ready to solve your problem, with on-schedule deliveries of precision-made parts possessing the exact physical and electrical characteristics you require.

It will pay you to find out, now, what Taylor can do for you. Please make your inquiry as specific as you can . . . including, if possible, a sketch or blueprint. Our engineers will give it their immediate attention.

Samples illustrated, from top to bottom:
Terminal plate, punched from Phenol Fibre sheet.
Pulley, machined from Vulcanized Fibre sheet.
Switch back plate. Phenol Fibre.
End lamination for small motors. Vulcanized Fibre.

TAYLOR FIBRE COMPANY

LAMINATED PLASTICS: PHENOL FIBRE • VULCANIZED FIBRE • Sheets, Rods, Tubes, and Fabricated Parts
NORRISTOWN, PENNA. • *Offices in Principal Cities* • Pacific Coast Plant: LA VERNE, CAL.

lighter

more durable

and costs less

This refrigerator door handle, custom molded for Norge Division, Borg-Warner Corporation, is typical of the advantages you gain by bringing your plastics problems to us. Made of polystyrene, this part is light, strong, and low in cost — yet it is far more serviceable than similar items because it is

LOGOQUANT treated

✻ Exhaustive tests as well as actual customer use have proved that LOGOQUANT gives to ordinary polystyrene parts substantially increased resistance to marring and the action of chemical cleaners, as well as higher luster and reduced dust attraction. Hence this low-cost material can be used with confidence for household and automotive parts of many kinds.

Ask us to submit facts and samples for your own tests. Here's a way to lower production costs with actual improvement in quality.

MICHIGAN PLASTIC PRODUCTS, INC.
3000 Franklin Street
Grand Haven, Michigan

Custom molders of thermoplastic materials. Complete facilities for molding, assembling, and LOGOQUANT treating.

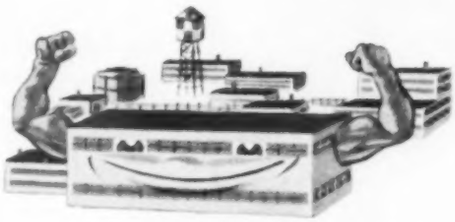
Greater Stability! A polyvinyl chloride-type resin of high molecular weight, Marvinol offers superior resistance to heat, light and other normally destructive factors.

MARVINOL® the new VINYL RESIN gives you all these advantages

Unique Versatility! Easy to process, Marvinol resins may be calendered, extruded, injection molded, used in non-aqueous dispersions, formulated as unplasticized rigids.

Broad Temperature Range! Products made from Marvinol resins show less heat deformation than other resins . . . offer positive advantages in low temperature flexibility.

Other Advantages, Too! Can give crystal clear transparency, brilliant or delicate colors . . . unusual "dryness". . . exceptional toughness and long life . . . may be tasteless, odorless . . . easily, quickly cleaned.



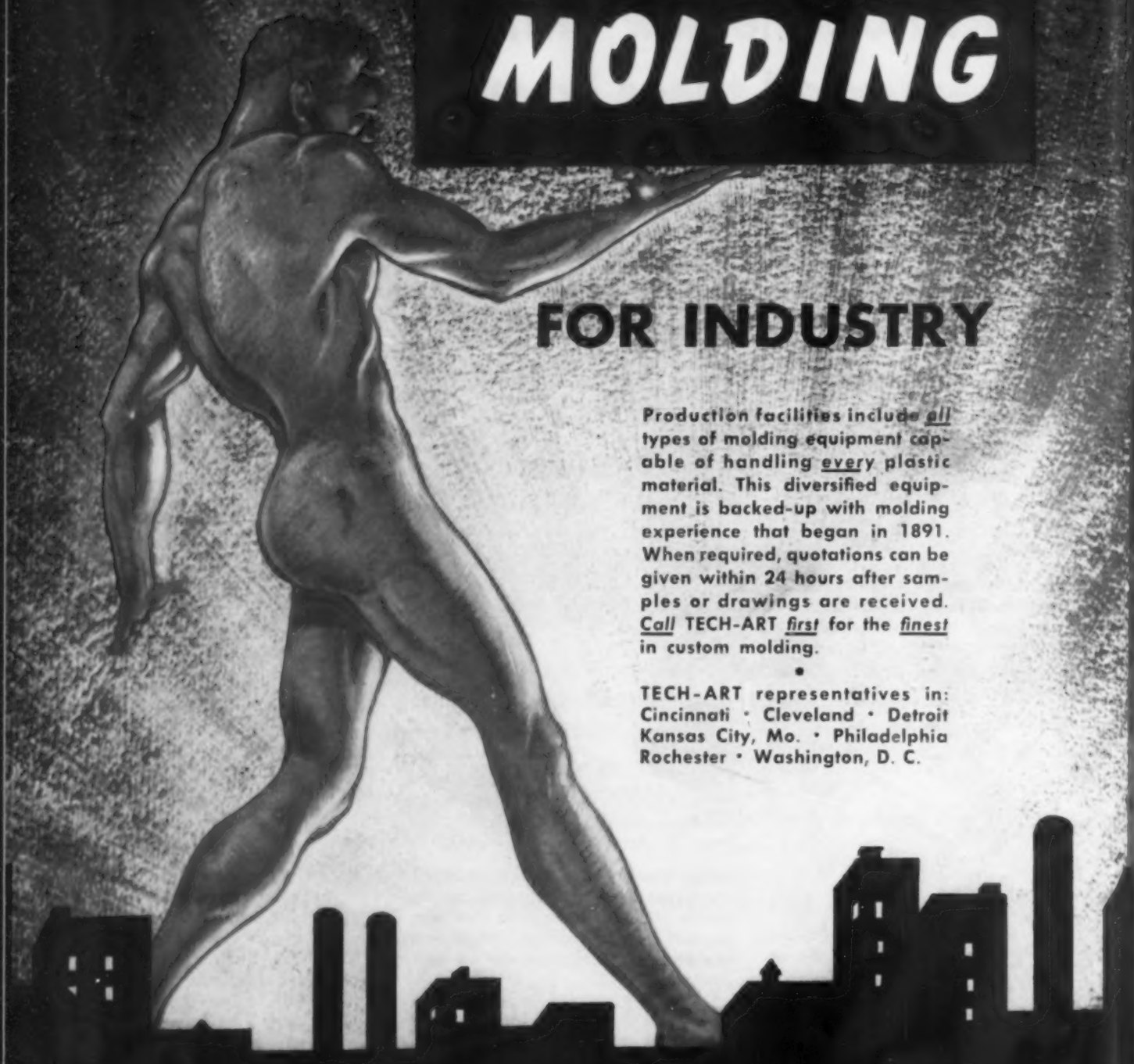
Ultra-Modern Plant! New Marvinol plant contains latest equipment to assure efficient operation, uniform product, highest quality. Production quantities of Marvinol resins are now available.

Close Cooperation! No division of The Glenn L. Martin Company compounds or fabricates in the plastics field. Let our sales engineers and modern customer service laboratory help solve your processing problems. Write on your company letterhead to: Chemicals Division, The Glenn L. Martin Company, Baltimore 3, Md.

Martin® Marvinol

RESINS, PLASTICIZERS AND STABILIZERS PRODUCED BY THE CHEMICALS DIVISION OF
THE GLENN L. MARTIN COMPANY • AN INTERNATIONAL INSTITUTION
"BETTER PRODUCTS, GREATER PROGRESS, ARE MADE BY MARTIN"

PLASTIC MOLDING



FOR INDUSTRY

Production facilities include *all* types of molding equipment capable of handling *every* plastic material. This diversified equipment is backed-up with molding experience that began in 1891. When required, quotations can be given within 24 hours after samples or drawings are received. *Call* TECH-ART *first* for the *finest* in custom molding.

•

TECH-ART representatives in:
Cincinnati • Cleveland • Detroit
Kansas City, Mo. • Philadelphia
Rochester • Washington, D. C.

TECH-ART PLASTICS COMPANY

41-01 36th Avenue, Long Island City 1, New York • AStoria 8-6050

step up gloss and toughness

Improved Abrasion Resistance with SANTOLITE MHP

60% vinyl resin + 20% plasticizer + 20% Santolite MHP 135

80% vinyl resin + 20% plasticizer. 200

Abrasion losses expressed in milligrams — Taber Abrader, H-22 wheels, 1 kg. load.

SANTOLITE MHP

A combination of Santolite MHP, plasticizer and polyvinyl chloride forms compositions with enhanced gloss and improved abrasion resistance. These qualities will be of interest to manufacturers of products ranging from plastic floor coverings and industrial belting to women's handbags.

Already an important component of many decorative, utility and protective coatings, Santolite MHP is compatible with and imparts unusual qualities to the vinyl resins. It can be used alone or in combination with a primary plasticizer in polyvinyl chloride and, being non-volatile, leads to dimensionally stable products.

Manufacturers will profit by investigating the valuable applications of Santolite MHP in coatings and sheetings. Write to MONSANTO CHEMICAL COMPANY, Plasticizers and Resins Department, 1700 South Second Street, St. Louis 4, Missouri. Use the coupon if more convenient.

District Sales Offices: New York, Philadelphia, Chicago, Boston, Detroit, Cleveland, Cincinnati, Charlotte, Birmingham, Houston, Akron, Los Angeles, San Francisco, Seattle. In Canada: Monsanto (Canada) Limited, Montreal.

Santolite: Reg. U. S. Pat. Off.

MONSANTO
CHEMICALS — PLASTICS

MONSANTO CHEMICAL COMPANY
Plasticizers and Resins Department
1700 South Second Street, St. Louis 4, Missouri

MPO-5

Please give me further information on Santolite MHP for_____

_____

Name_____ Title_____

Company_____

Address_____

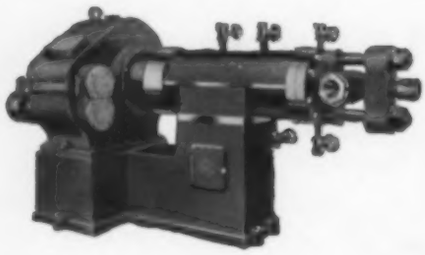
City_____ State_____

SERVING INDUSTRY...WHICH SERVES MANKIND

NE.

Almost every day we learn of new uses for N E Extruders—Mixing Mills and Hydraulic Presses. Things we thought impossible a few years ago are ordinary practice today. We are as old as the rubber industry and as new as the newest plastic materials. N E — Tubers — Extruders — Strainers — Masticators—Grinders or whatever you choose to call them are processing everything from vegetables to hush hush explosives. The principle is the same, it's the speed, pressure and heat that makes the difference. It will pay you to call in N E engineers for they have learned that almost nothing is impossible.

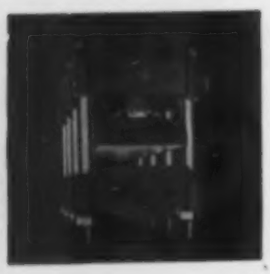
PLASTIC STRAINERS and EXTRUDERS to SPECIFICATION



LABORATORY and PRODUCTION MILLS

The N E line of Mixing Mills offers a broad selection of equipment. We are able to assume full responsibility for we operate 3 complete steel casting foundries and modern machine shops. From the smallest of laboratory mills to the largest of production mills, National Erie engineers can help you in your material processing work.

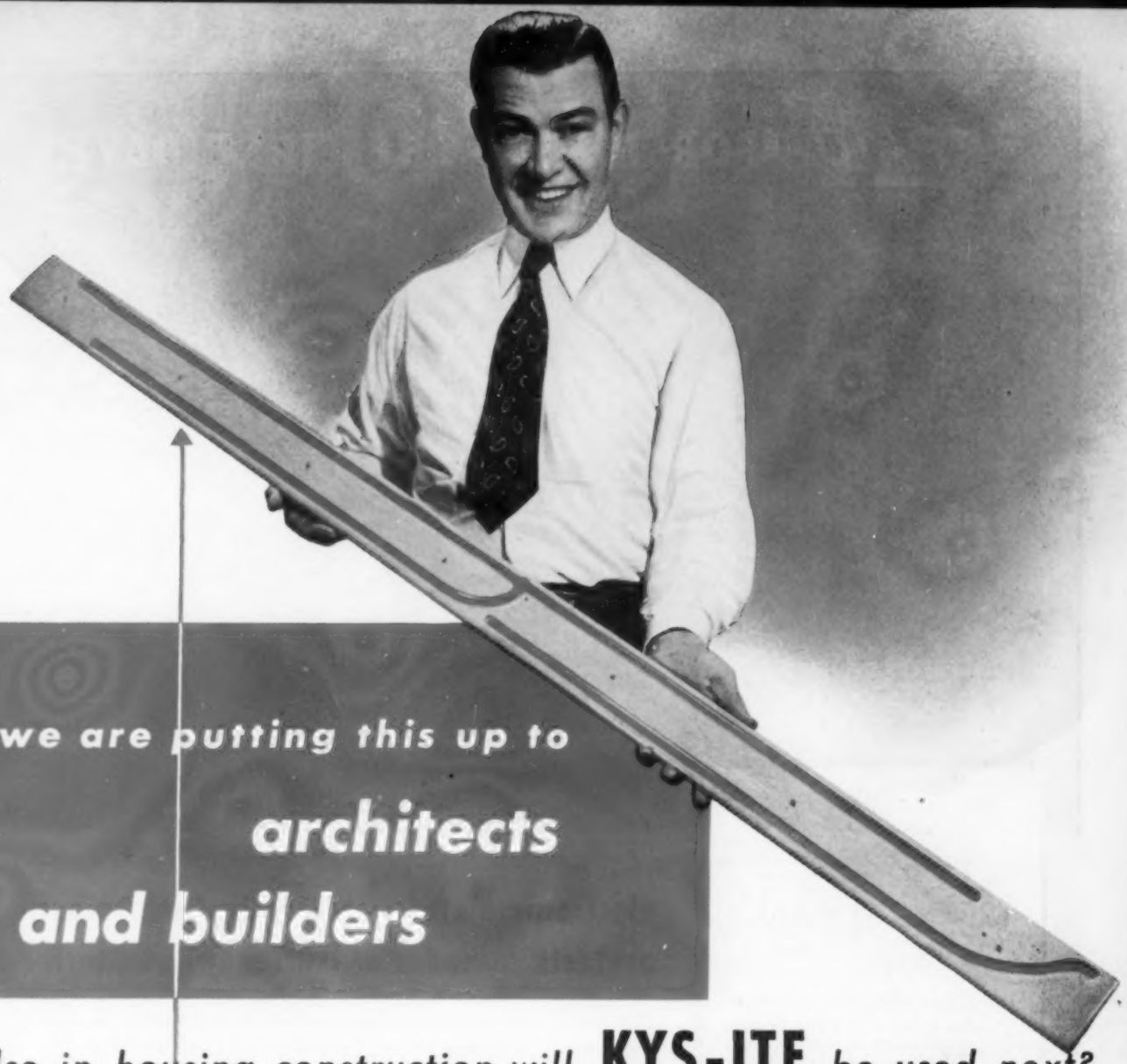
HYDRAULIC PRESSES TO SPECIFICATION



Write for Complete Catalog

NATIONAL ERIE CORPORATION

ERIE, PENNSYLVANIA • U. S. A.



we are putting this up to

architects and builders

Where else in housing construction will KYS-ITE be used next?

Here's the latest application of the material that's making headline news today! This time it's the building field that's turning to KYS-ITE . . . with Andersen Corporation of Bayport, Minn., leading the way.

See for yourself what opportunities to "do the impossible" are presented by KYS-ITE's unusual combination of properties—and consider Keyes' ability to handle ticklish molding problems (in this case, molding sill tracks more than 64 inches long).

We invite manufacturers, designers and engineers in *any* industry to compare KYS-ITE with whatever material they're now using . . . *for no other type of material offers KYS-ITE's combination of properties:* including great strength and lightness; beauty and durability; good dielectric qualities; wide color range.

More information on custom molding to specifications? Our advisory service is ready —call on us now.

This Andersen Gliding Window ...ns from side to side. Sashes slide smoothly ...sill tracks made of KYS-ITE—molded by ...yes for Andersen. And what an improve...nt over the formerly-used wood! KYS-ITE ...n't warp, shrink or swell. Its beauty lasts; ... easily cleaned—a wipe and it's bright.

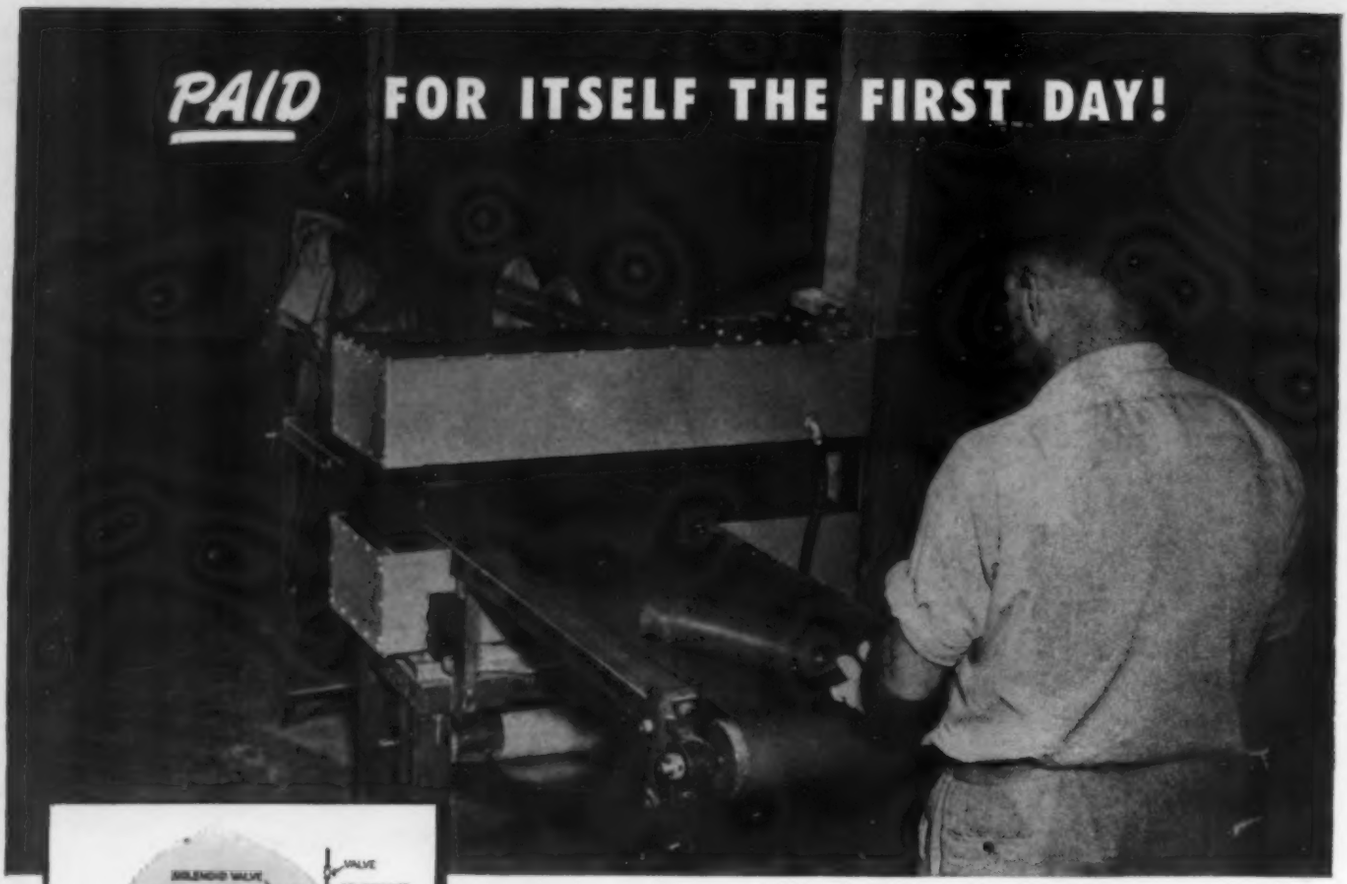
KEYES FIBRE COMPANY
420 Lexington Avenue
New York 17, New York
Plant at Waterville, Maine

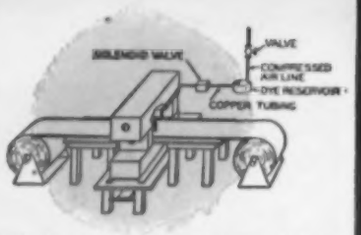
KEYES
MOLDED PRODUCTS

KYS-ITE
(Reg. U. S. Pat. Off.)

Preformed Plastic Combining Long-Fibered Wood Pulp and Synthetic Resin

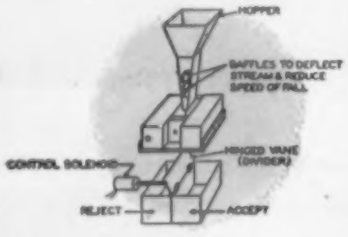
PAID FOR ITSELF THE FIRST DAY!





INSPECTION OF CONTINUOUS STRIP

An ideal set-up for plastic sheeting and film. When metal is detected, air pressure sprays dye on the contaminated portion. Many modifications possible to fit varying needs.



INSPECTION OF FALLING MATERIAL

A good way to inspect molding powders, fillers, and resins. When metal is detected, the hinged vane deflects the stream into the reject bin.

Electronic Metal Detector inspects plastic rolls, protects calender at National Automotive Fibres

"In one operation our electronic metal detector saved us $2,000," reports National Automotive Fibres, Inc., Trenton Division.

"By detecting a fairly large piece of tramp metal embedded in the plastic we were processing, it prevented severe damage to our calender roll . . . saved the cost of an expensive regrinding operation."

In this plant, a preliminary visual inspection of plastics eliminates obvious pieces of metal. After the plastic has gone through the milling roller, the rolls are carried on a conveyor belt through the detector's inspection aperture. If metal is present, a bell rings, the roll is removed and unwound, and the particle is eliminated.

This modern electronic equipment can spot every type of metal and alloy — magnetic or non-magnetic, regardless of its depth in the material. Reports on units in use for more than two years attest to its reliability — even in detecting particles as small as 70 thousandths of an inch in diameter!

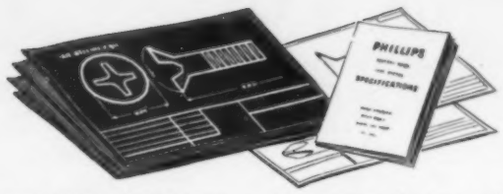
Here's a unique opportunity to protect your valuable tools, dies, molds, engraved rolls, and calenders . . . reduce lost production time . . . safeguard product quality . . . preserve customer good will. For descriptive literature, write ALLIS-CHALMERS, MILWAUKEE 1, WIS. A 2458

Now . . . made by RCA, sold exclusively by

ALLIS-CHALMERS *Metal Detectors*

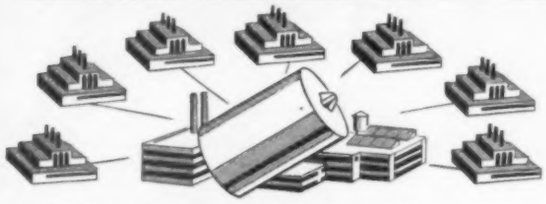
ONLY PHILLIPS RECESSED HEAD SCREWS

OFFER DIMENSIONAL UNIFORMITY INSURED BY CLOSE ENGINEERING CONTROL



ESTABLISHED STANDARDS . . . Every manufacturer of Phillips Cross Recessed Head Screws is supplied with complete engineering and production data which prescribes precise dimensions and tolerances.

CENTRALIZED PRODUCTION TRAINING . . . And, before production is started on Phillips Screws, each plants' supervisory staff puts in an extended training period with Phillips engineers.



COMMON SOURCE OF RECESS FORMING TOOLS . . . Punches for forming the Phillips Cross Recess in all types and sizes of Phillips Screws are formed from master types at one plant. The manufacture of gauges for maintaining uniformity of Phillips Drivers and Bits are similarly centralized.

ENGINEERS' MEETINGS . . . Standards carefully established at the very beginning are rigorously maintained through meetings of "Phillips Recessed Head Standards Committee". Engineers from all plants meet to exchange ideas, discuss problems and learn about recent developments.

All these precautions to secure absolute dimensional uniformity are just part of the care taken to produce Phillips Cross Recessed Head Screws that give users *all* the advantage of a cross recess engineered for practical production.

Speed and ease of driving in production assembly demands that the driver and recess fit smoothly, perfectly, the same way every time, all the time. With Phillips Screws, you can depend on it.

GET ALL THE ADVANTAGES OF ASSEMBLY WITH CROSS RECESSED HEAD SCREWS . . .

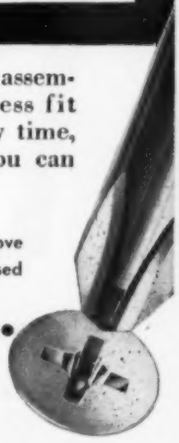
GET **PHILLIPS** *Recessed Head* **SCREWS**

Wood Screws • Machine Screws • Self-tapping Screws • Stove Bolts

25 SOURCES

American Screw Co.
Central Screw Co.
Continental Screw Co.
Corbin Screw Div. of American Hdwe. Corp.
Elco Tool & Screw Corp.
The H. M. Harper Co.
Lamson & Sessions Co.
Milford Rivet and Machine Co.
National Lock Co.
National Screw & Mfg. Co.
New England Screw Co.
Parker-Kalon Corporation
Pawtucket Screw Co.
Pheoll Manufacturing Co.
Reading Screw Co.
Russell Burdsall & Ward Bolt & Nut Co.
Scovill Manufacturing Co.
Seaboard Screw Corp.
Shakeproof Inc.
The Southington Hardware Mfg. Co.
The Steel Company of Canada, Ltd.
Sterling Bolt Co.
Stronghold Screw Products, Inc.
Wales-Beech Corp.
Wolverine Bolt Company

GET THIS NEW BOOKLET of facts that prove the top value, top economy of Phillips Recessed Head Screws. It's free . . . use the coupon.



Phillips Screw Mfrs.,
c/o Horton-Noyes Co.
1800 Industrial Trust Bldg.
Providence, R. I.

Send me the new booklet—"How to Select Recessed Head Screws for Practical Production Driving".

Name _____

Company _____

Address _____

MP-29

Industry is on the Move ... Westward

UNION PACIFIC RAILROAD COMPANY
OMAHA 2, NEBRASKA

G. F. ASHBY, PRESIDENT

To American Industry:

The Union Pacific West offers industry proximity to products of ranch, mine and forest...ample power, fuel, water...healthful living conditions in scenic, recreational regions...and native-born, high-type labor.

Our faith in the future of this vast territory is confirmed by our current 200-million-dollar investment program for new equipment, improved and expanded facilities to provide shippers and travelers with the utmost in rail transportation.

We are at your service.

Yours very truly,

G F Ashby

President,
Union Pacific Railroad

George F. Ashby

* One of a series of advertisements based on industrial opportunities in the states served by Union Pacific Railroad.

Unite with Union Pacific in selecting sites and seeking new markets in California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, Oregon, Utah, Washington, Wyoming.

*Address Industrial Department, Union Pacific Railroad
Omaha 2, Nebraska

UNION PACIFIC RAILROAD

Road of the Daily Streamliners

Just as a man is known by the company he keeps, so is a company known by the customers it keeps.

GMP lays no claim to being the "oldest and largest." We do aim to deliver more than we promise in plastics molding service and quality.

That is the type of leadership GMP has assumed and shall maintain.

Ask our customers about us... ask us about our customers.

TRADE MARK GMP REG. U.S. PAT. OFF.

MOLDERS OF PLASTICS

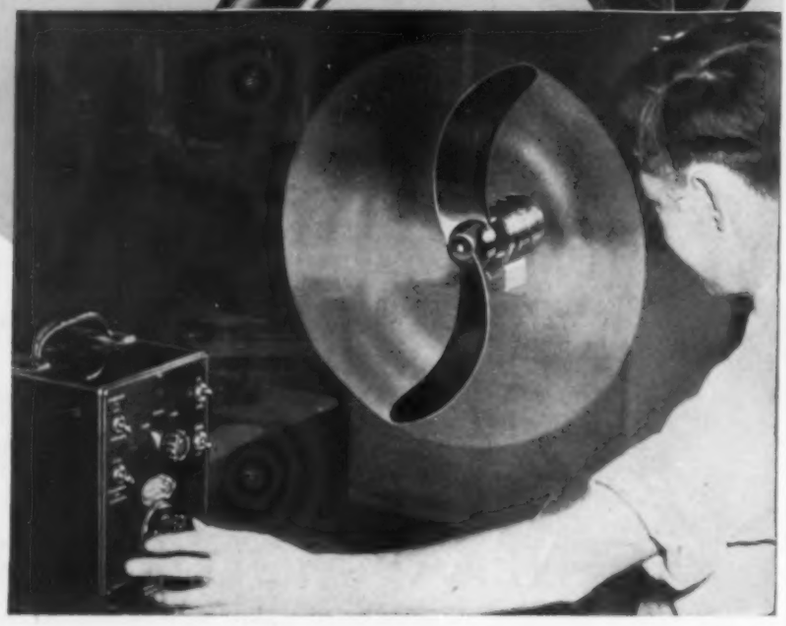
SPI SOCIETY OF THE PLASTICS INDUSTRY

GENERAL MOLDED PRODUCTS · INC.

OFFICE AND PLANT DESPLAINES, ILL. SUBURB OF CHICAGO

. . . close-tolerance production

FOR C



Precise product quality control—from latest-type molding equipment to testing laboratory—insures uniformity, accuracy and dependability in all plastics products molded by General Industries.

Here's real evidence of the close-tolerance attention your plastice products receive when they are precision-molded by The General Industries Company.

These plastic fan blades—ranging in size from 18″ to 30″—are molded by General Industries for a leading midwest manufacturer of residential and commercial fans.

CLOSE-TOLERANCE PRODUCTS

To assure smooth, steady operation, at speeds up to 2000 rpm, absolute balance is an essential requirement in each blade. General Industries attains this absolute balance through precision molding—and does it on a mass production basis. Tolerances are held so closely that rejects are negligible. Production costs are down to a welcome low level—another example of The General Industries Company's ability to help manufacturers reduce costs with well-planned plastics.

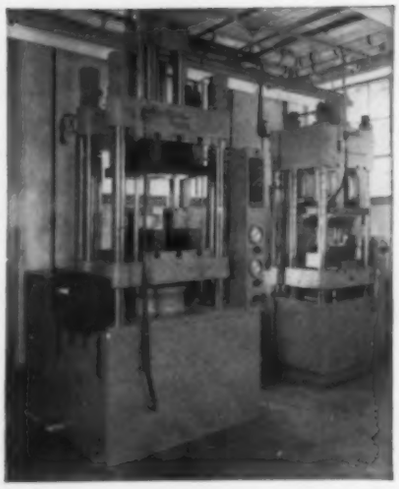
With experience gained from more than 25 years of developing and improving plastics molding techniques, General Industries has a valuable fund of engineering knowledge ready to serve you. Write us *today.*

FOR THE *BEST* IN MOLDED PLASTICS

THE GENERAL INDUSTRIES CO.
MOLDED PLASTICS PIONEERS
DEPARTMENT R • ELYRIA, OHIO

WHERE TOUGH PROBLEMS ARE SOLVED

Exterior view of Shaw engineering department and laboratory, where plastics products start as an idea and emerge ready for efficient manufacture.



On these presses Shaw engineers work out correct molding techniques for maximum quality production at minimum cost.

Quality control section where constant material testing insures uniform quality, from the start to the end of a run.

SHAW

SHAW INSULATOR COMPANY

MOLDERS SINCE 1892

160 COIT STREET IRVINGTON 11, N. J.

QUALITY MARK ON MOLDED PLASTICS

Plastics problems that come outside the scope of existing facilities, materials and methods are just the projects Shaw is equipped to tackle. Shaw has repeatedly widened the efficient use of plastics, solving problems that had previously ruled out the choice of these materials for a product.

On the toughest problems, you can depend upon Shaw to develop molding techniques and quality control procedures that assure superior plastics products at minimum cost.

FROZEN FOODS GET A "HOT" WRAP

No other packaging material can accomplish all that Plax's polyethylene film does.

As the photograph shows, it is transparent and will stretch to give a tight wrap for odd shapes, like poultry. (The stretch is several hundred percent without rupture.) At sub-zero temperatures, it remains tough and pliable. It has excellent "feel." It is non-toxic, odorless, tasteless and chemically inert. It can be heat-sealed. The goodness of meats and vegetables is fully protected but never hidden.

Plax polyethylene film comes in sheet form and in plain or gusseted tubing. For the complete story about this and other Plax products, please write.

PLAX
FOR PLASTIC SHEET, ROD & TUBES
NOT SUBSTITUTES ··· IMPROVEMENTS

P. O. BOX 1019 ★ HARTFORD 1, CONNECTICUT
In Canada — Canadian Industries, Ltd., Montreal

Molded Plastic Parts of This Type Are "Duck Soup" For Boonton

Housing Molded by Boonton for Bendix Radio, Div. Bendix Aviation Corp., Baltimore, Md.

Have you a Production Problem that Molded Plastics might solve?

Just for a moment, let your thinking wander beyond the radio housing illustrated above. Sure, we mold plastic radio cabinets, but perhaps your products call for another kind of housing —such as for a business machine, an appliance, or some other type of equipment.

If so, it will pay you to consider Boonton. We're fully equipped to mold the housings, parts, or products you need, in medium or large-sized runs from the best-suited raw plastic material, by one of the 4 major molding processes: straight compression, transfer, plunger, and injection.

Many of our customers have saved substantial sums of money by asking our engineers to talk to their engineers before their products reached the purchasing stage. They've been amazed and pleased at the ways we've come up with design and production suggestions that shaved costs all the way around. Perhaps we can do the same for you. Maybe we've learned something in our 25 years of molding plastics that can be helpful to you. We'll be glad to share this experience with you. Write or phone The Boonton Molding Company, Boonton 3, N. J., Boonton 8-2020.

SEND US YOUR BLUEPRINTS OR SAMPLES. We'll tell you whether the parts you want can be plastic molded, and if they can, how much it will cost. Be sure to include full data on conditions of application or use, initial quantities needed, annual requirements, and delivery date.

Boonton

MOLDERS OF MOST PLASTICS BY MOST METHODS

An Announcement . . .

Interlake Chemical Corporation
of Delaware
Union Commerce Building
Cleveland 14, Ohio

To Our Customers:

By diverting our raw materials to Monsanto Chemical Company, Plastics Division, Springfield, Massachusetts, we are able to continue supplying phenolic molding compounds.

Orders should be placed with us as usual and shipments will be Monsanto material, so labeled and packed. Selling prices will be Monsanto's at time of shipment. We are in a position to make prompt delivery.

Due to the quality of our product and our service in the past, we trust we may continue to serve you in the future.

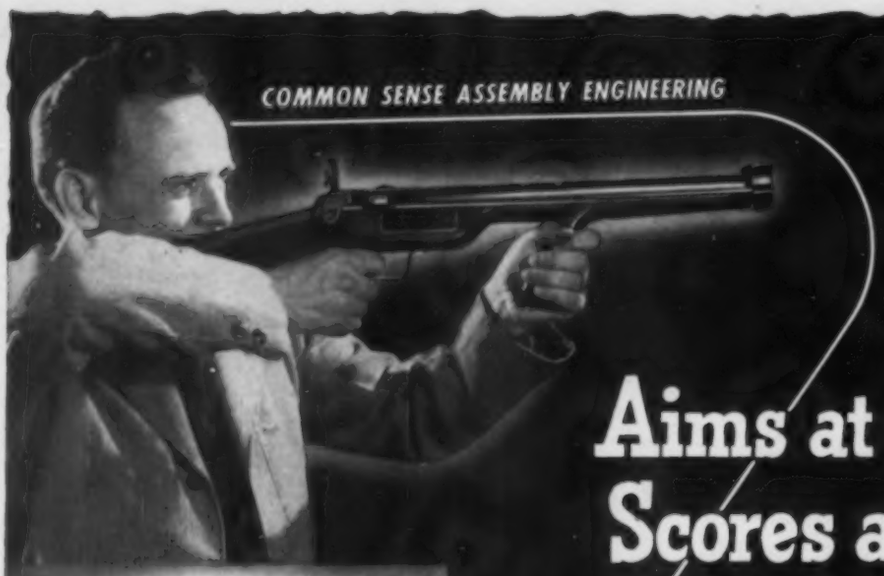
Yours very truly,

INTERLAKE CHEMICAL CORPORATION

INTERLAKE CHEMICAL CORPORATION

Executive Offices: Union Commerce Bldg., Cleveland 14, Ohio
Branch Offices; 10 Post Office Square, Boston, Mass.; 332 S. Michigan Ave., Chicago, Ill.; 1855 Industrial St., Los Angeles, Calif.; Smith Tower, Seattle, Wash.

COMMON SENSE ASSEMBLY ENGINEERING

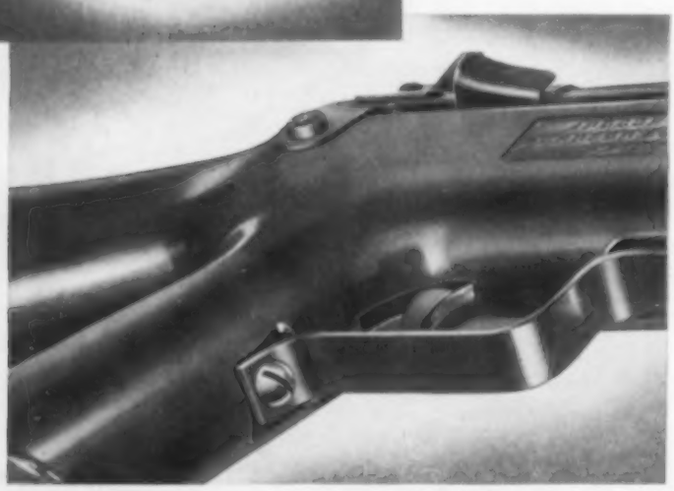


P-K

Aims at Savings.... Scores a Bull's-eye!

AVOIDS TAPPING . . . .
IMPROVES STRENGTH

Two P-K Phillips Binding Head Type "F" Screws are used to fasten the butt plate to the stock. The neat-looking, burr-free Phillips Recess "dresses up" the butt, and avoids possibility of burrs snagging clothing.
One P-K Type "F" Screw fastens the trigger guard to the rugged Durez stock, molded by Plastics Manufacturers, Inc.



IN the assembly of this realistic looking indoor target gun, **Johnson Automatics, Inc.,** faced fastening problems that were easily solved by P-K Engineers.

Naturally, it was important to keep costs down, so screws were needed that would provide the simplest, speediest, most economical fastenings of metal and plastic units to the sturdy, handsomely finished Durez Plastic stock. They also wanted extra strength to withstand rough handling by youngsters.

By choosing P-K Self-tapping Screws, they scored a "bull's-eye" on all requirements. The need for mold-slowing inserts or tapping operations was completely eliminated, because Type "F" Screws cut their own matching threads.

If you are out "gunning" for needlessly high assembly costs in your plant, call in a P-K Assembly Engineer. He can show you that in 7 out of 10 jobs, P-K Self-tapping Screws will save up to 50% in assembly work hours—and in many cases open the way to improvements in product design. If you prefer, mail assembly details for recommendations. Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.

Sold Only Through Accredited Distributors

A TYPE AND SIZE FOR EVERY METAL AND PLASTIC ASSEMBLY

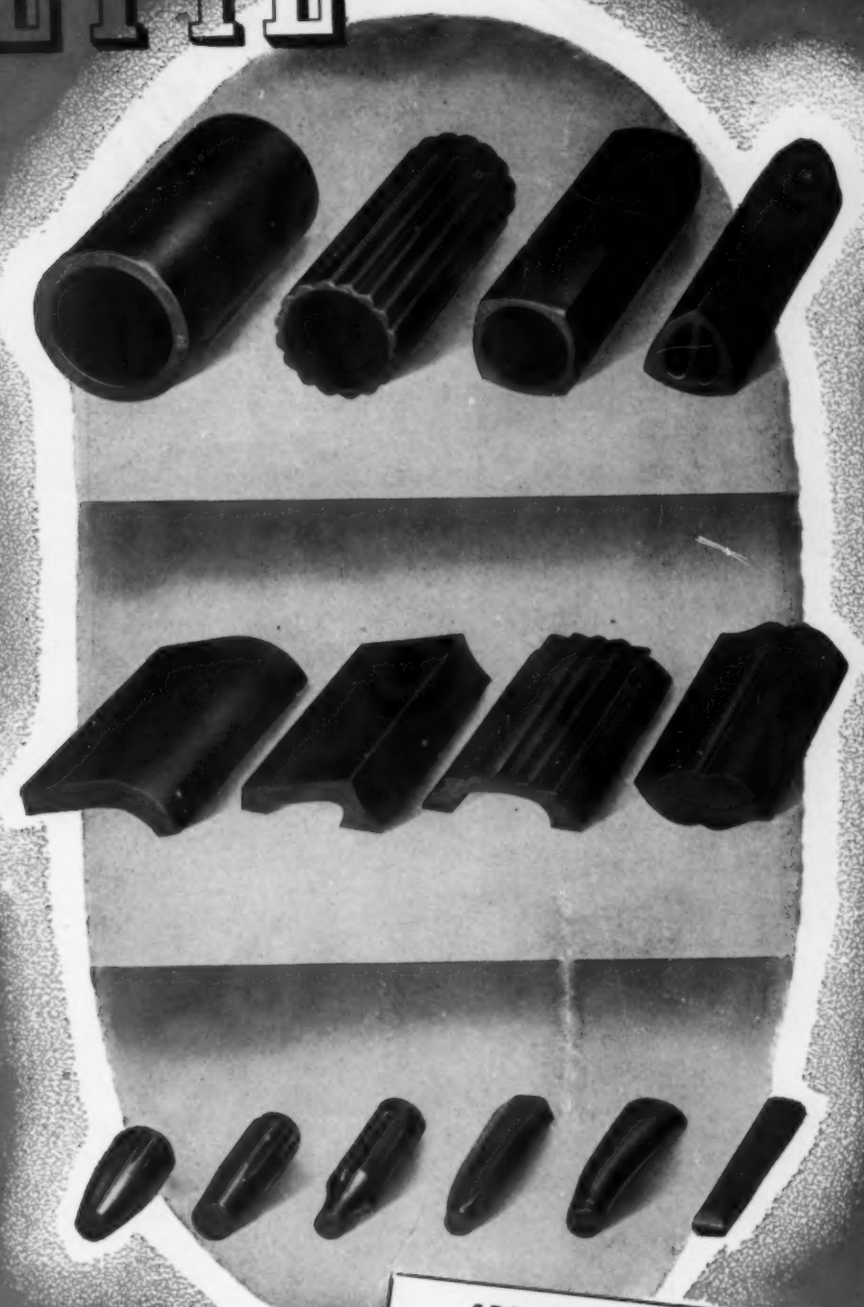
P-K* *Reg. U.S. Pat. Off.

PARKER-KALON SELF-TAPPING SCREWS

OTHER PARKER-KALON PRODUCTS COLD-FORGED SOCKET SCREWS • HARDENED SCREWNAILS AND MASONRY NAILS • SHUR-GRIP FILE AND SOLDER IRON HANDLES • METAL PUNCHES • DAMPER REGULATORS AND ACCESSORIES

A CAST PHENOLIC RESIN OF EXCEPTIONAL QUALITIES

MARBLETTE



Outstanding among plastics, Marblette has a jewel-like depth and a complete color range which duplicates the appearance of precious stones, tortoise shell and ivory.

Its almost infinite variety of colors is available in transparent, translucent, opaque, or in mottled effects. Marblette also comes in a water clear form known as "Crystle" in a wide choice of colors.

Marblette's machining characteristics, resistance to oils and acids, non-inflammability and exciting beauty make it ideal for countless manufacturing needs.

MARBLETTE will help plan your world of tomorrow. The Marblette staff of engineers offers its services to help with your manufacturing problems. Write to us outlining your needs.

SPECIAL CASTINGS

Marblette is supplied in sheets, rods, tubes, and special castings such as cutlery handles, kitchen utensil handles, pipe stems, cigarette holders, clock cases, automotive trimmings, jewelry items, buckles, etc. Special shapes made to customer's specifications can be supplied provided draft is all one way.

THE MARBLETTE CORPORATION

Manufacturers of Phenolic Resins since 1929

37-21 THIRTIETH ST., LONG ISLAND CITY 1, N. Y.

PLASTICS PREHEATERS

pay off 3 *ways*

1 **BETTER PRODUCTS** Dielectric heating minimizes surface-crust formation—giving more uniform preforms, reducing scrap losses. Finishing operations are easy and quick because of thinner flash on mold parting line.

2 **SUPERIOR DESIGN** Job-tested G-E preheaters incorporate all the requirements for heavy-duty, high-production industrial use: sturdy construction, complete accessibility for maintenance, portability, and space-saving designs with more heat per cubic foot.

3 **HIGH PERFORMANCE** Production increases up to 75 per cent result from warm-up time saved in mold . . . less expensive compounds are made easy to mold . . . curing time is accelerated through uniform chemical reaction initiated before molding.

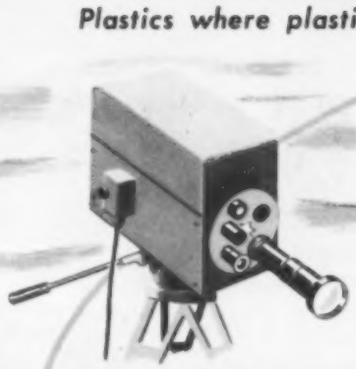
INVESTIGATE how your molding operations can profit by the three big dividends of G-E preheaters by contacting the Heating Specialist in the nearest G-E Office. In the meantime, send for free bulletin, GEA-4623A. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

Electronic Heaters

GENERAL ELECTRIC

675-180

Plastics where plastics belong



The best applications for Synthane laminated plastics stem from Synthane's combination of properties . . . chemical, electrical and mechanical. For example, Synthane is moisture and corrosion resistant, hard, dense, easy to machine and has unusual electrical insulating qualities.

In addition, Synthane is structurally strong, light in weight and an excellent anti-friction material. The set plastic, Synthane is stable over wide variations in temperature.

Here is our type of technical plastics at work in a television channel selector . . .

for low power factor, high dielectric strength and ease of machining

The ANDREA channel selector turret (right) is the nerve-center of any television receiver, contains thirteen channel tuning circuits and an FM tuning circuit, each one electrically independent of the other.

Synthane is employed for a number of the intricate parts to insure extreme electrical and mechanical precision and rugged operation. It's an appropriate job for useful, hard-working Synthane . . . a timely example of plastics where plastics belong.

If there's a use for Synthane in your product, why not let us help you before you design? Write for our complete catalog of Synthane plastics today! Synthane Corporation, 8 River Road, Oaks, Pa.

SYNTHANE *where Synthane belongs*

DESIGN • MATERIALS • FABRICATION • SHEETS • RODS • TUBES
FABRICATED PARTS • MOLDED-MACERATED • MOLDED-LAMINATED

These Electrical Applications for

SYNTHANE

Will Give You Ideas for Other Uses

High dielectric strength, low power factor, low dielectric constant are but a few of the characteristics that qualify Synthane for so many electrical purposes. However, use of Synthane in these and similar electrical applications is due, not only to its effective insulating qualities, but also to its combination of other properties. Synthane is light in weight, moisture and corrosion resistant, structurally strong, quickly and easily machined and stable over a wide temperature range.

Here in one material are the requirements for making many products better, faster, more easily or more economically.

If Synthane's properties suggest a use in your product, let us work with you before you design . . . we can help you find what you want in plastics, we may save you considerable time, trouble and money. Send for your copy of the Synthane plastics catalog today.

● ● ● ● ● TO FIND OUT HOW SYNTHANE CAN HELP YOUR PRODUCT ● ●

SYNTHANE CORPORATION, 8 RIVER ROAD, OAKS, PA.

Gentlemen:

Please send me without obligation a complete catalog of Synthane technical plastics.

*Name*_____

*Company*_____

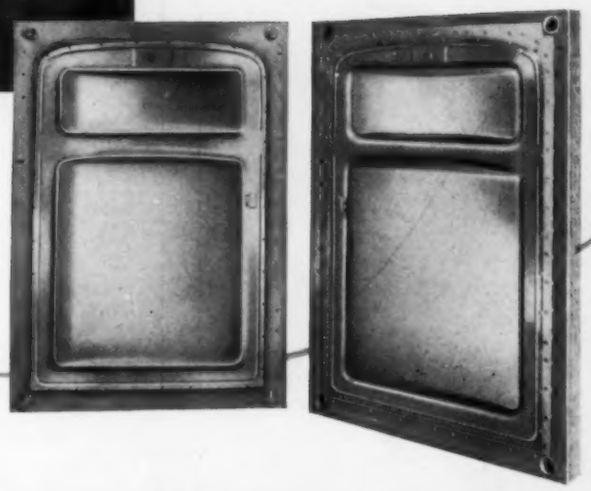
*Address*_____

*City*_____ *Zone*_____ *State*_____

SYNTHANE

S

PLAN YOUR PRESENT AND FUTURE WITH SYNTHANE TECHNICAL PLASTICS • SHEETS • RODS • TUBES • FABRICATED PARTS • MOLDED-LAMINATED • MOLDED-MACERATED



Craftsmanship

SPECIAL COLD FORGED PARTS • STANDARD CAP SCREWS • HARDENED AND PRECISION GROUND PARTS • SHEET METAL DIES FROM THE LARGEST TO THE SMALLEST • JIGS • FIXTURES • STEAM-HEATED PLASTIC MOLDS • SPECIAL PRODUCTION TOOLS • R-B INTERCHANGEABLE PUNCHES AND DIES • DIE MAKERS' SUPPLIES

ALLIED WITH PLASTICS PRODUCTION

ALLIED is serving the plastics industry with men thoroughly skilled in the production of steam-heated plastic molds. Every specification for accuracy of form and for fine surface finish is met exactly. It is an Allied service that has developed with the industry—that is in step with the requirements of the industry today.

ALLIED PRODUCTS CORPORATION

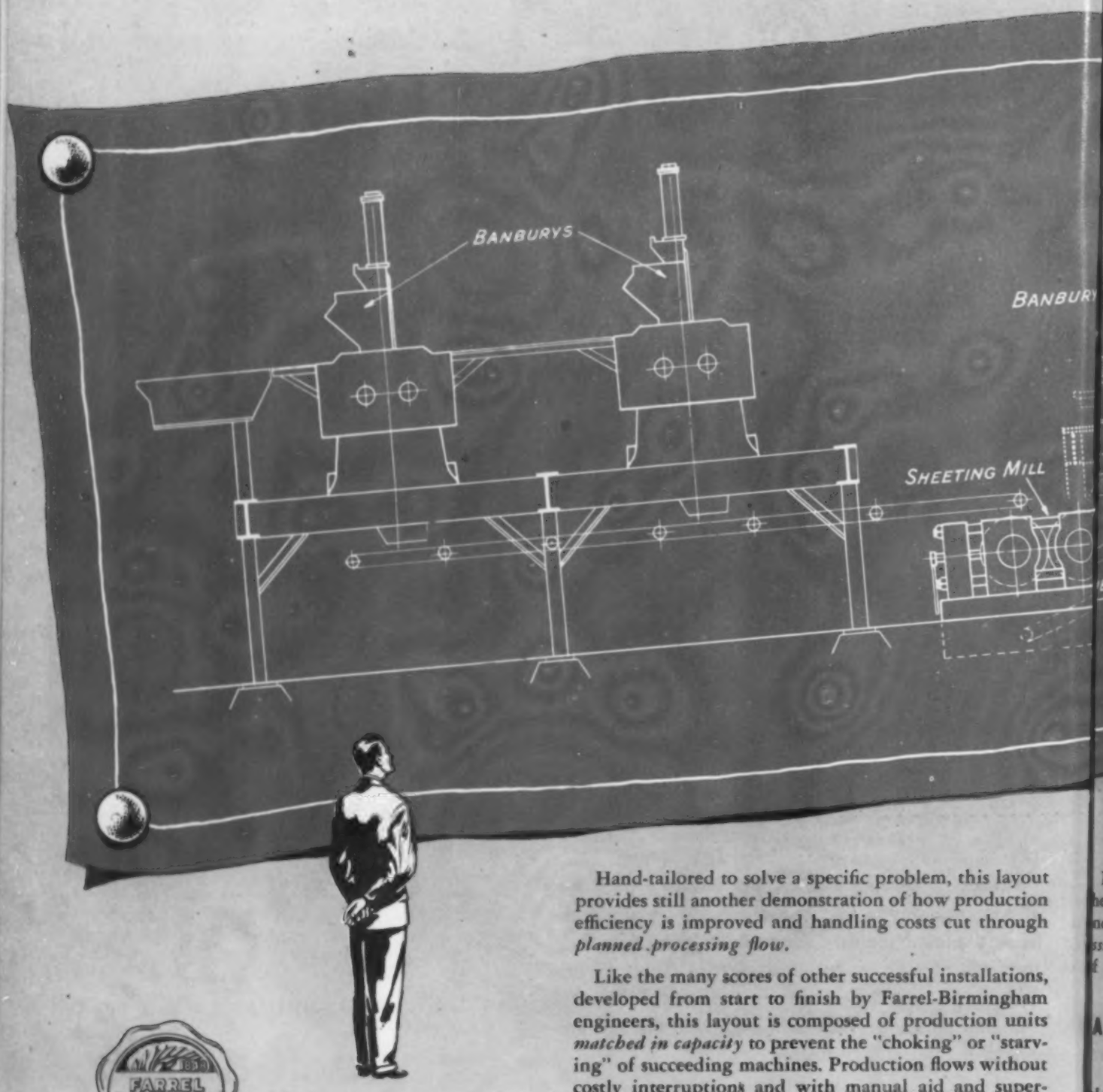
DEPARTMENT 2-P

4622 LAWTON AVENUE DETROIT 8, MICHIGAN

PRECISION • EXPERIENCE • DEPENDABILITY

ALLIED CORPORATION PRODUCTS

Here's another F/B demonstration of ENGINEERE



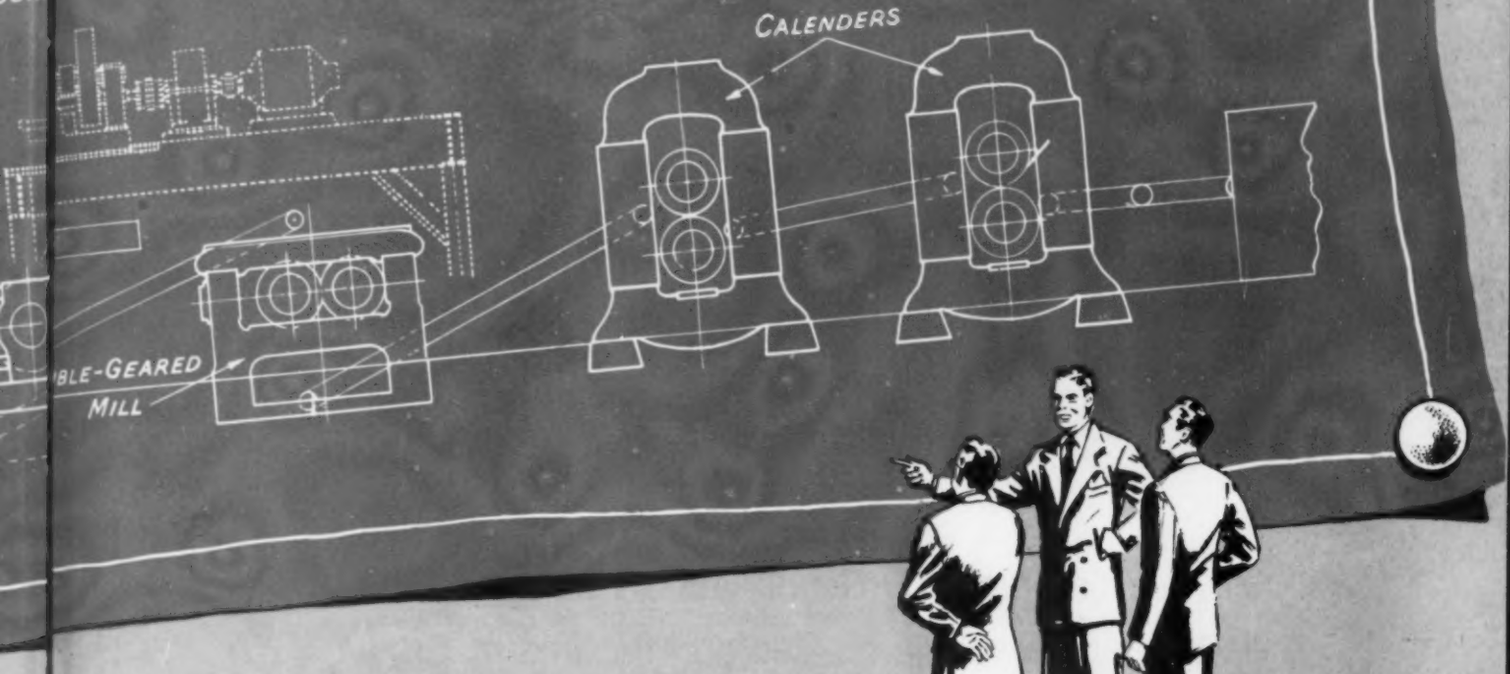
Hand-tailored to solve a specific problem, this layout provides still another demonstration of how production efficiency is improved and handling costs cut through *planned processing flow.*

Like the many scores of other successful installations, developed from start to finish by Farrel-Birmingham engineers, this layout is composed of production units *matched in capacity* to prevent the "choking" or "starving" of succeeding machines. Production flows without costly interruptions and with manual aid and supervision reduced to a minimum.

FARREL CENTENNIAL

RE ROCESSING FLOW

Schematic layout developed by Farrel-Birmingham engineers to synchronize production through the progressive steps in the manufacture of asphalt tile. The two Banburys discharge mixed stock onto a conveyor which carries it to the sheeting mill. The sheet, as well as the mottle chips from the third Banbury are automatically conveyed to the double-geared mill and then to the two calenders for reducing to finish gage.



Farrel-Birmingham engineers will be glad to discuss the possibility of improving your production efficiency and cutting your handling costs through *planned processing flow*. Why not call on them? No obligation, of course.

FB-445

ARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

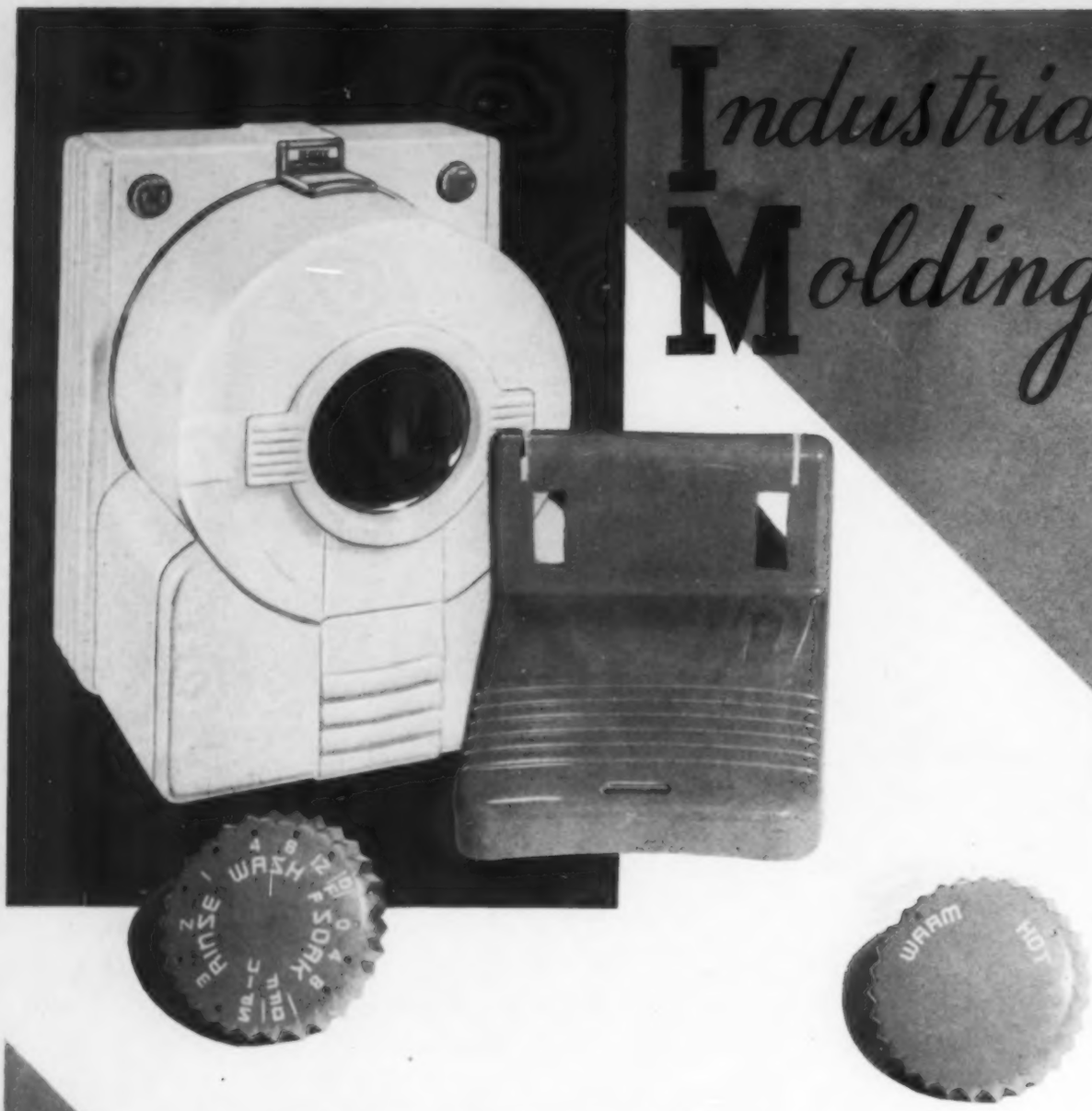
Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Boston, Pittsburgh, Akron, Chicago, Los Angeles, Tulsa, Houston.

F-B PRODUCTION UNITS

Banbury Mixers • Plasticators • Pelletizers • Mixing, Grinding, Warming and Sheeting Mills • Bale Cutters Tubing Machines • Refiners • Crackers • Washers Calenders • Hose Machines • Hydraulic Presses • and other equipment for processing rubber and plastic materials.

Farrel-Birmingham

Industrial Molding



Precision parts for Bendix Automatic Washing Machine molded and finished by Cruver. Parts illustrated are soap door, selector switch and dial timer.

CRUVER MFG. CO.

Est. 1896

MOLDING • FABRICATING • LAMINATING • FINISHING
"BAS-RELEEF" • DECORATING • ASSEMBLY • SPRAYING

2460 WEST JACKSON BLVD., CHICAGO 12, ILLINOIS

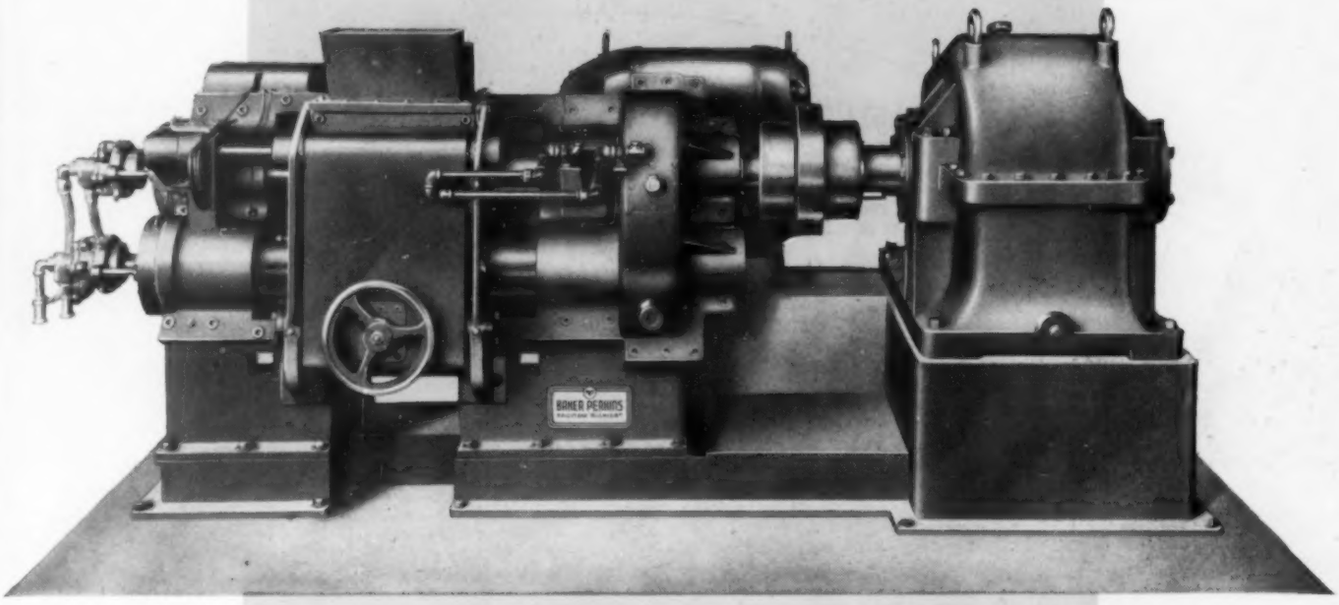
NEW YORK 2 West 46th Street | DETROIT General Motors Building | ST. LOUIS Cotton Belt Building

Announcing

the remarkable new

BAKER PERKINS MASTICATOR

Engineered specifically for the efficient compounding of plastics with pigments and fillers



The new-type masticator blades are cored for the circulation of cold water or brine for uniform cooling of the blade surface. Because of their unique design *these new blades constantly draw material down into the mixing zone* thereby eliminating need for ram or compression cover. Jacketed mixing trough and blades are cooled by means of a newly developed high pressure, high velocity system *which results in more efficient cooling* than has heretofore been possible in this type machine. Many other features make the new Baker Perkins Masticator today's most up-to-date production mixer.

BAKER PERKINS INC.

CHEMICAL MACHINERY DIV.

SAGINAW, MICHIGAN

INDUSTRY—RECOGNIZED
HOME TRAINING IN PLASTICS

PLASTICS INSTITUTE CURRICULUM

Embraces Comprehensive Coverage of Following Subjects

- Introduction to Plastics
- Origin and Role of the Plastics Industry
- Formation of Phenolic Plastics, Part I
- Formation of Phenolic Plastics, Part II
- Laminated Phenolic Resins
- Urea and Melamine Resins and Their Characteristics
- Cellulose Plastics, Part I
- Cellulose Plastics, Part II
- Acrylic and Polystyrene Resins
- Polyvinyl Resins and Their Characteristics, Part I
- Polyvinyl Resins and Their Characteristics, Part II
- Miscellaneous Resins, Polymides
- Synthetic Rubbers and Rubber-like Materials
- Utilization of Farm Products and Vegetable By-Products
- Physical Properties of Plastics, Part I
- Optical Properties of Plastics Materials
- Molding of Plastics—Preparatory Measures
- Compression and Transfer Molding
- Compression Molding and Equipment
- Injection Molding—Part I
- Injection Molding—Part II
- Extruded Plastics and Their Applications
- Developing Heat and Pressure for Molding
- Design of Compression Molds
- Design of Transfer and Injection Molds
- Design of Molded Plastics Parts—Part I
- Design of Molded Plastics Parts—Part II
- Cold Molding of Plastics
- Laminating of Plastic Materials
- Resin Bonded Wood Veneer
- Low Pressure Laminating
- Machining of Plastics—Part I
- Machining of Plastics—Part II
- Casting of Plastic Materials

Home Study and Resident School courses approved for Veteran training under G.I. Bill.

Many men and women engaged in some branch of the Plastics Industry have availed themselves of the opportunity to advance in their present jobs and prepare for better ones, through Plastics Institute's Home Study Course. Home Study and Resident School graduates are successfully employed in all branches of the industry. **Why not suggest this training to members of your organization?**

MP-28

Plastics
INDUSTRIES TECHNICAL
INSTITUTE

Francis A. Gudger, President · John Delmonte, Technical Director

NEW YORK—31-28 Queens Blvd., Long Island City • CHICAGO—3810 N. Broadway
LOS ANGELES—1601 South Western Ave.

PLASTIC *and* METAL

together, as steadfast a team as

DAMON *and* PYTHIAS

Below . . . A Clarostat
Wire-wound Potentiometer and Rheostat
Product shown thru courtesy of
CLAROSTAT MANUFACTURING CO., INC.

To Left —
Midget Size Clarostat
Potentiometer and Rheostat

CLAROSTAT CONTROLS SOLVE RESISTANCE PROBLEMS

In fact, as Clarostat states it, "Clarostat is interested solely in resistance. This specialization is reflected in the personnel and material engaged in Clarostat production. Every worker, machine, operation represents the end result of over a quarter-century spent in learning how to make quality resistors at mass-production prices."

Consolidated as a plastics production source, holds this company's precision requirements in highest regard . . . for we, too, after many years of service have built our custom-molding reputation upon quality. For your products, too, some plastic may help metal components to behave best — perform best! We'd be glad for the opportunity to discuss the possibilities with you. Inquiries invited!

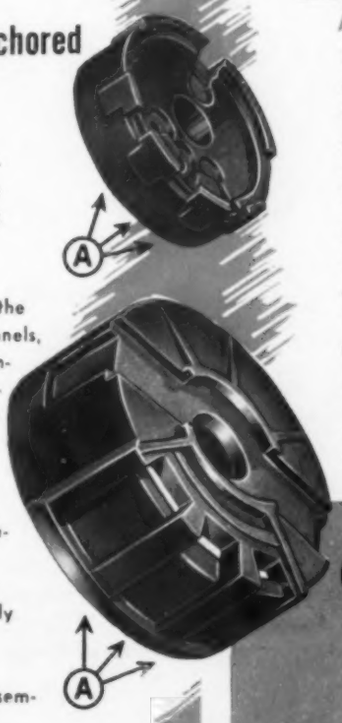
When Metal Controls are Anchored in Plastic--They Stay Put!

Plastic maintains a strong — and goodly-influence over Metal . . . especially when designed as base structures for complex circuit assemblies.

Modern mold development encourages product designers to specify in plastic the most involved arrangement of levels, channels, holes, slots and recesses . . . each precision-positioned so that when the metal components are assembled, thereto, they fit like a glove!

NOTE PHOTOS HEREWITH

They indicate what proven molding techniques can accomplish in small space. Both bases shown actual size. Featured reference to letters "A" identify specially recessed channels for permanently positioning and accurately anchoring multiples of metal terminals . . . Final assemblies are pictured at top of page.



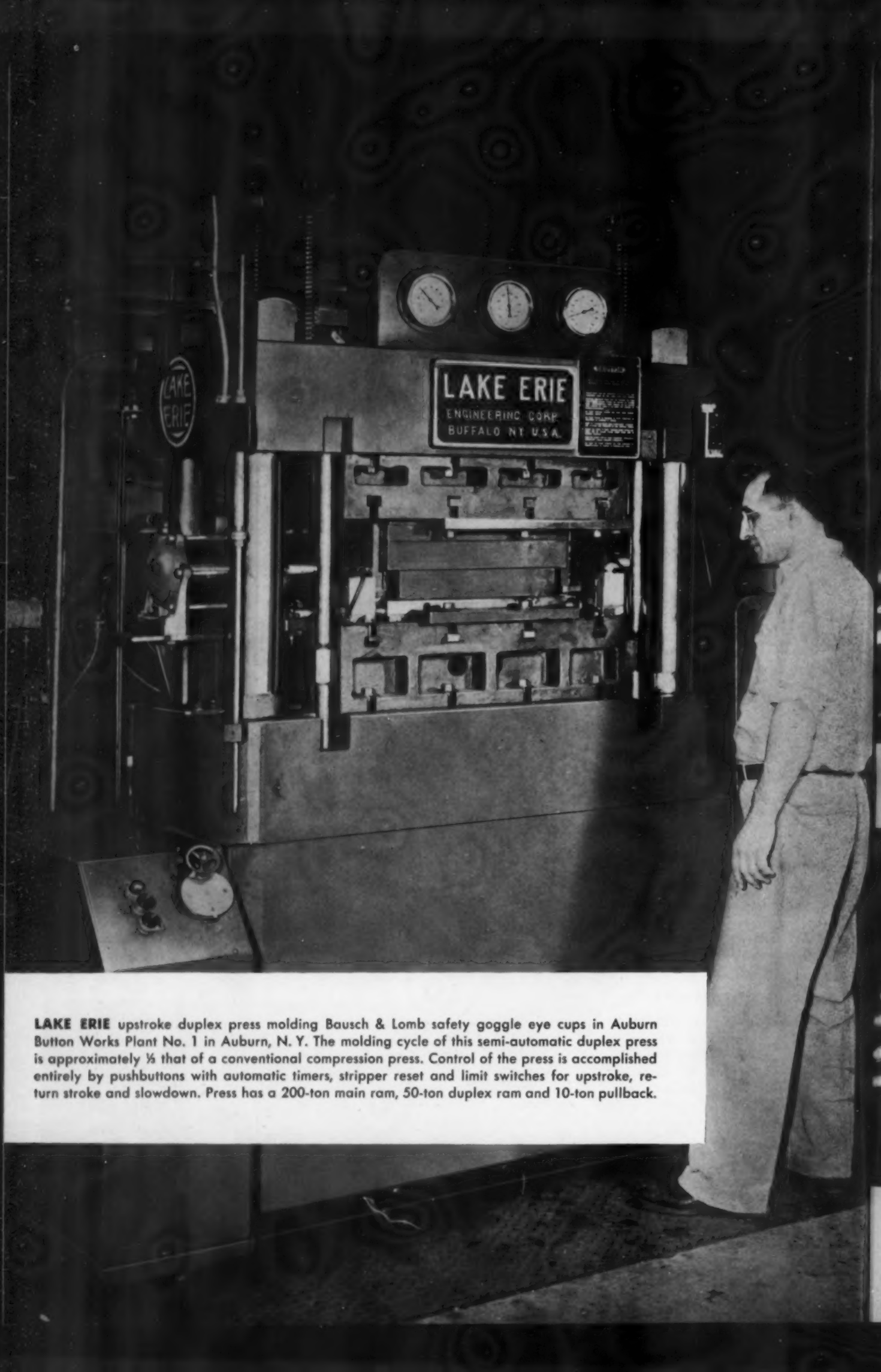
Consolidated

MOLDED PRODUCTS Corporation
309 CHERRY STREET,
SCRANTON 2, PA.

CMP

PRODUCT DEVELOPMENT • MOLD DESIGN • MOLD CONSTRUCTION • PLUNGER MOLDING • TRANSFER MOLDING • INJECTION MOLDING • COMPRESSION MOLDING

Branches: NEW YORK, 1790 Broadway • CHICAGO, 549 W. Randolph St. • DETROIT, 550 Maccabees Bldg. • CLEVELAND, 4614 Prospect Av. • BRIDGEPORT, 211 State Street.



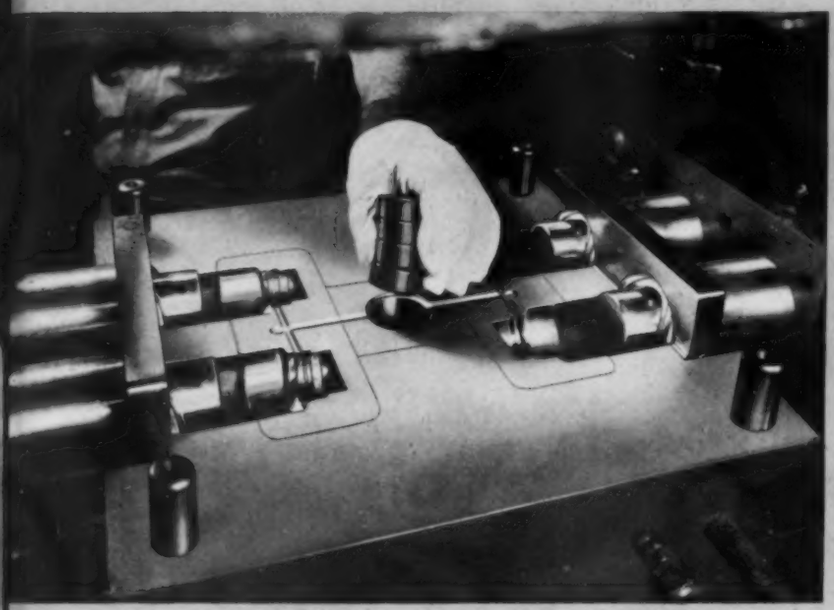
LAKE ERIE upstroke duplex press molding Bausch & Lomb safety goggle eye cups in Auburn Button Works Plant No. 1 in Auburn, N. Y. The molding cycle of this semi-automatic duplex press is approximately ⅕ that of a conventional compression press. Control of the press is accomplished entirely by pushbuttons with automatic timers, stripper reset and limit switches for upstroke, return stroke and slowdown. Press has a 200-ton main ram, 50-ton duplex ram and 10-ton pullback.

AUBURN BUTTON WORKS

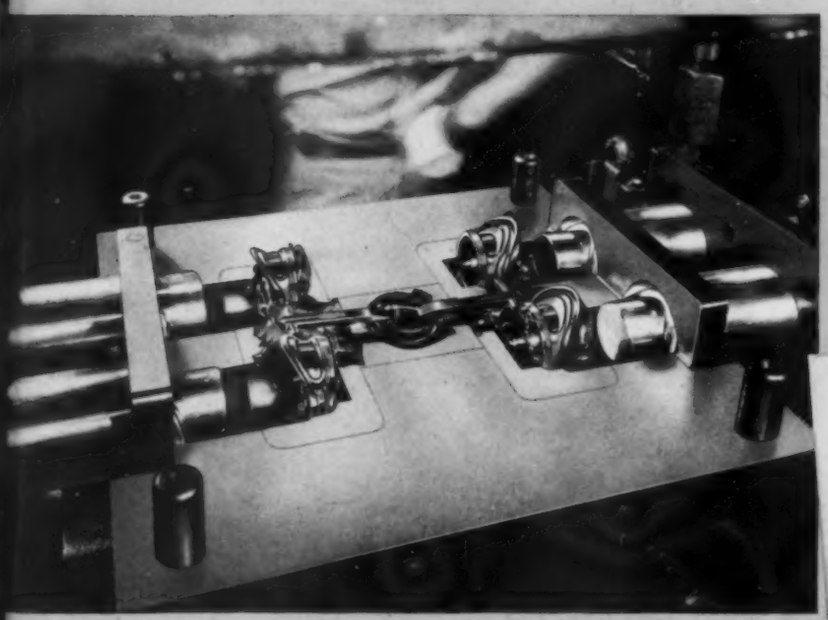
molds safety goggle eye cups in 1/3 the time

with NEW UPSTROKE Duplex Press

LAKE ERIE
ENGINEERING CORP.
BUFFALO, N.Y. U.S.A.



PREFORMS of 1900 Black Durez—a nodular type rag-filled high-impact phenolic material—being placed in lower mold cavity. Preforms are electronically preheated.



EYE CUPS are produced with clamping pressure of 180 tons on main ram and 40 tons on duplex ram. Temperatures, pressures and time cycles are preset and automatically controlled.

LAKE ERIE high-efficiency molding presses—including compression, duplex, laminating and laboratory models—are used by leading molders to improve production efficiency and product uniformity. Through constant research and development, Lake Erie continually offers the most advanced improvements in press design and construction. No matter what your needs, Lake Erie has or will quickly design and build a press to meet your specific requirements with complete satisfaction. Write today for bulletin illustrating and describing the many standard presses now available or let us know the particular type of press you desire and we will furnish complete details.

LAKE ERIE ENGINEERING CORP.

MANUFACTURERS OF
HYDRAULIC PRESSES AND SPECIAL MACHINERY
General Offices and Plant:
868 Woodward Avenue, Buffalo 17, N. Y.

OFFICES IN PRINCIPAL CITIES AND FOREIGN COUNTRIES

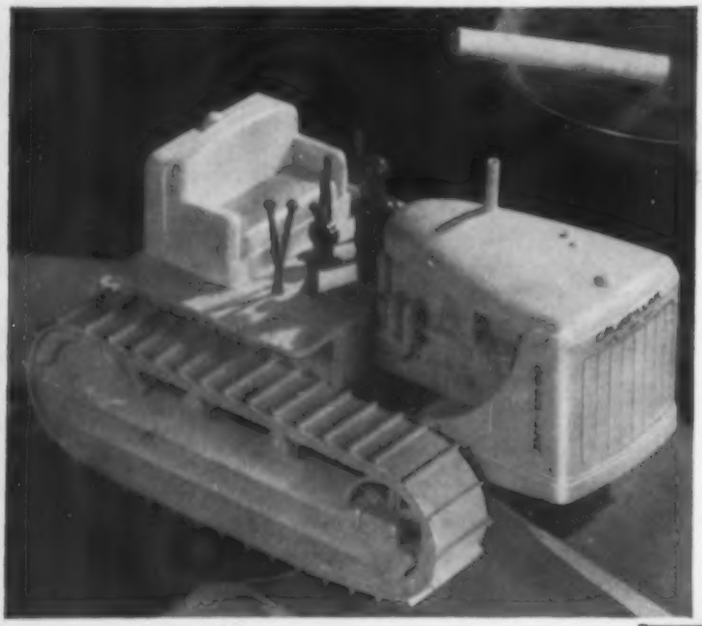
Leading manufacturer of hydraulic presses—all sizes and types—plastics molding...metal working...forging...metal extrusion...processing...rubber vulcanizing...stereotyping...special purpose.

FINISHED S-51 Eye Cups and Goggles, one of many types produced by Bausch & Lomb to meet practically every occupational requirement for eye protection.

There are good reasons for each KOPPERS Molding Powder

The use to which a molded plastic is to be put dictates the characteristics required. Koppers technical service is at your service to match your requirements with the proper plastic.

CELLULOSE ACETATE



A TRACTOR ON A DESK PUTS AN ORDER INTO THE FACTORY

This scale model of the Caterpillar heavy-duty diesel D-7 tractor, complete in every detail and small enough to sit beside an ash tray on a customer's desk, was made from Koppers cellulose acetate by the Cruver Manufacturing Company, Chicago. Cellulose acetate was picked for this job because of its indestructibility and resiliency; even the tiny gearshift levers resist breakage. It is made from a 22-piece mold and is in the Caterpillar "highway yellow." It's not a toy, but a sales tool made from Koppers plastic.

ROUGH ON THE STEAK AND SMOOTH ON THE HANDS

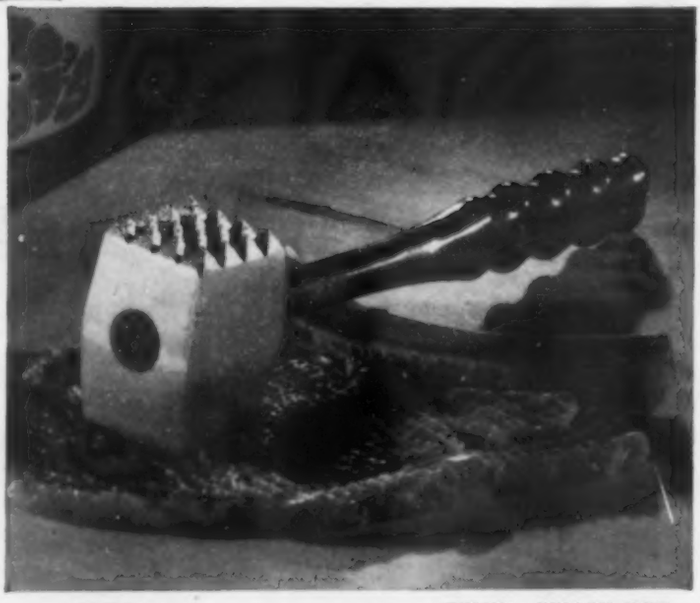
The handle of this Plasmetl "Tenderizer" is of Koppers Ethyl Cellulose. This tough plastic is used to add color, cleanliness and comfort to the handle. It is splinter-free and resilient. It is "warm" to the touch. It is molded to the fingers. These properties give unparalleled sales appeal to just a handle.

The Tenderizer was made by Plastic Metal Manufacturing Company, Chicago.

POLYSTYRENE

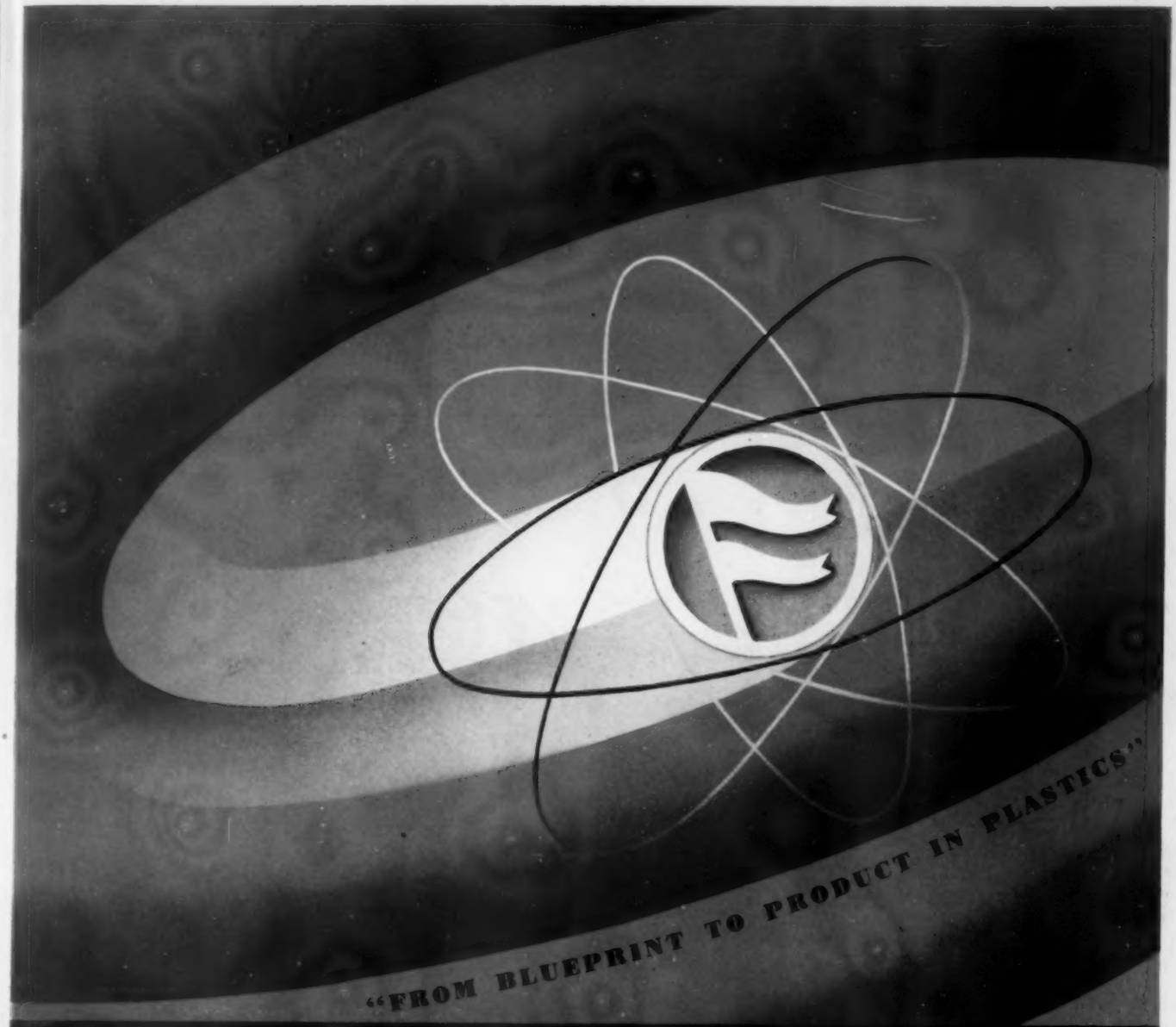
A JEWEL IN HER FINGERS AND A QUICK SALE IN THE STORE

These polystyrene Nu-lock clothes pins, designed by Dold and Morgan Plastics of Oakland, California, and made with Koppers Polystyrene, have a great merchandising advantage over their more prosaic wooden competitors. They are clean, transparent, sparkling and have real feminine appeal.



ETHYL CELLULOSE

KOPPERS COMPANY, INC.
Pittsburgh 19, Pa.



FELSENTHAL PLASTICS

G. FELSENTHAL & SONS, INC.
4120 W. Grand Ave. • Chicago 51, Ill.

New York Office
225 W. 34th St., New York 1, N. Y.

Detroit Office
731 Fisher Building, Detroit, Mich.

Ask on your letterhead for our NEW booklet No. 7 "Felsenthal Plastics"

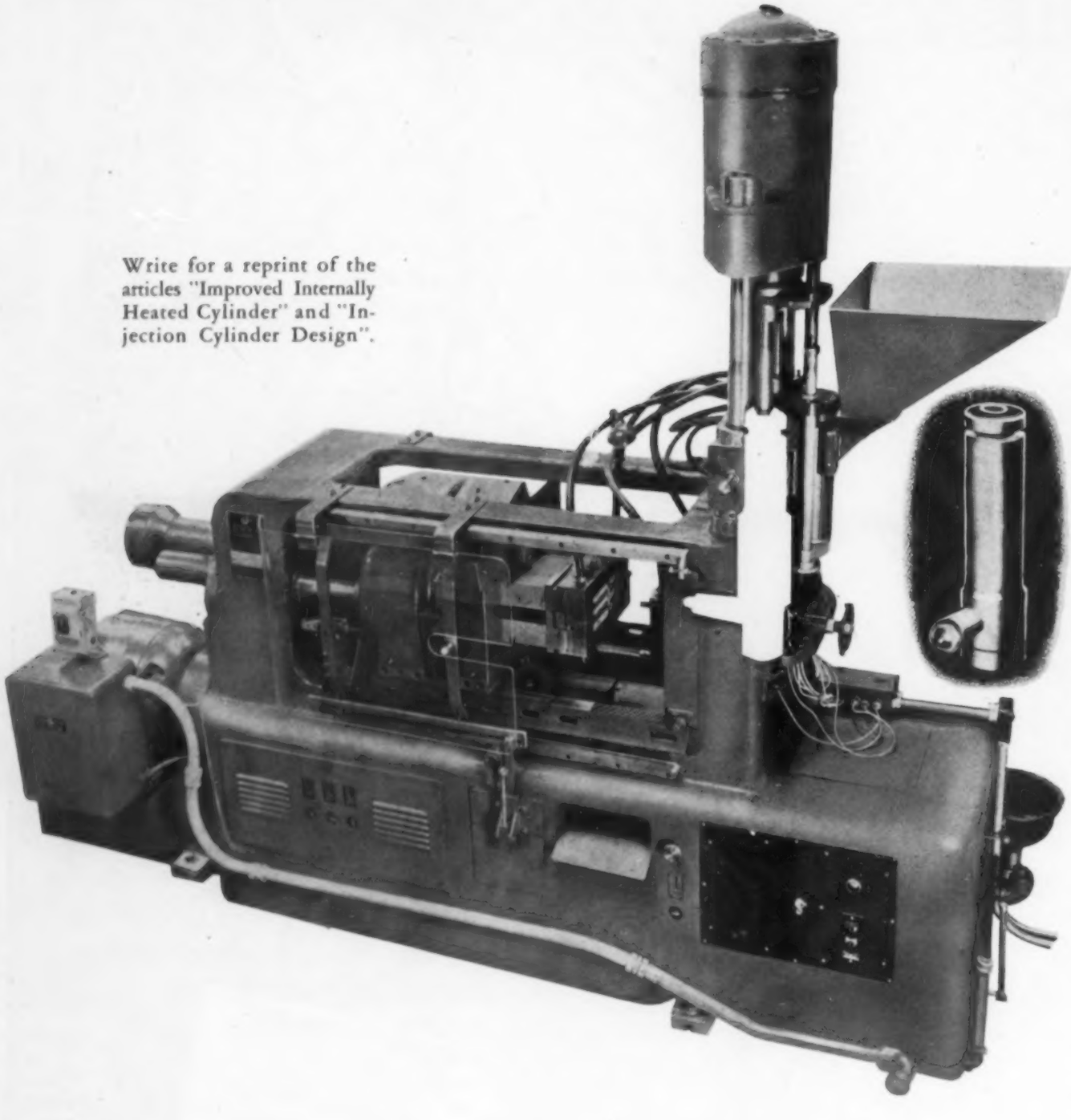
COMPLETE PRODUCTION SERVICES
including

- Injection Molding
- Complete Fabricating and Assembly Facilities
- Pressure forming and Deep Drawing of Acrylic Sheet
- Finishing, Spraying, Three Dimensional Painting and Silvering

All Thermoplastic Materials

INTERNAL HEAT....

Write for a reprint of the articles "Improved Internally Heated Cylinder" and "Injection Cylinder Design".



REPRESENTATIVES

New York	Steven F. Krould
Chicago	Elmer C. Maywald
Detroit	Thoreson-McCosh
Cincinnati	Index Machinery Corp.
Leominster	Standard Tool Co.
Cleveland	Don W. Williams
San Francisco, Cal.	J. Fraser Roe

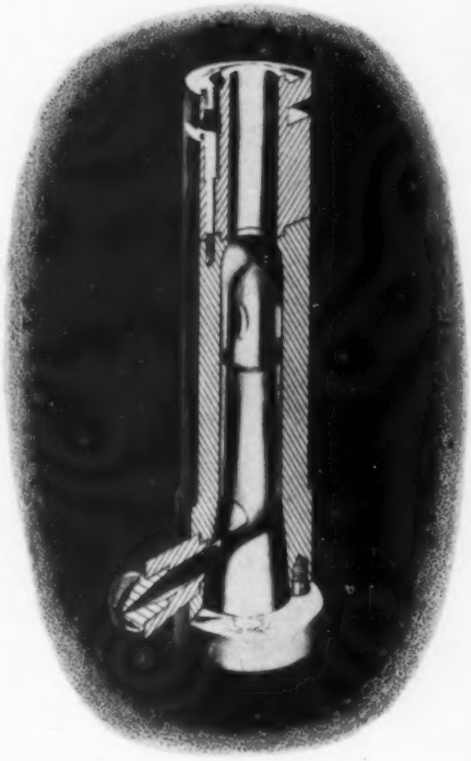
FOREIGN

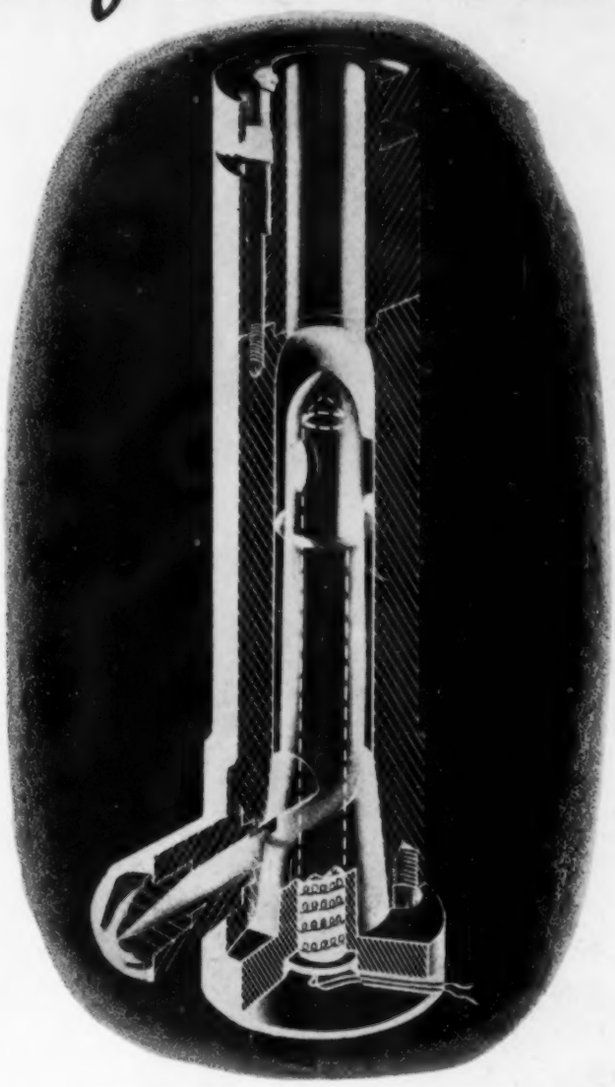
Toronto, Canada	Modern Tool Works, Ltd.
London, England	Dowding & Doll, Ltd.
Calcutta, India	Frances Klein & Co.
Sydney, Australia	Scott & Holladay, Ltd.

LESTER

makes the heart of the machine

BEAT FASTER





The molding industry knows that the efficiency of an injection molding machine depends primarily on the effectiveness of the injection cylinder. Lester has perfected a cylinder which will plasticize all thermoplastic materials more rapidly and more effectively than any other type of plastic molding equipment.

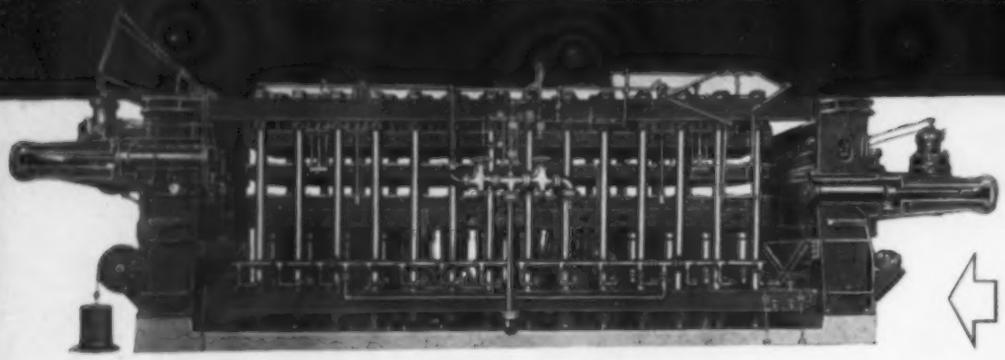
The only vertical injection cylinder on the market owes its unequalled performance to many sound design factors, but the most important of these is internal heating of the spreader. While the previous shot is setting up in the mold, the spreader is *helping* to heat the material in the cylinder, not *dissipating* its heat! This heat is independently controlled to temperatures within + or -2°. A completely annular material passage with no dividing fins or transverse joints in the plasticizing zone, insures even, effective pressure from plunger tip to nozzle. The result is faster plasticization and greater production.

INJECTION MOLDING MACHINES

Distributed by LESTER-PHOENIX, INC.

2621 Church Avenue • Cleveland, Ohio

ADAMSON UNITED HYDRAULIC PRESSES

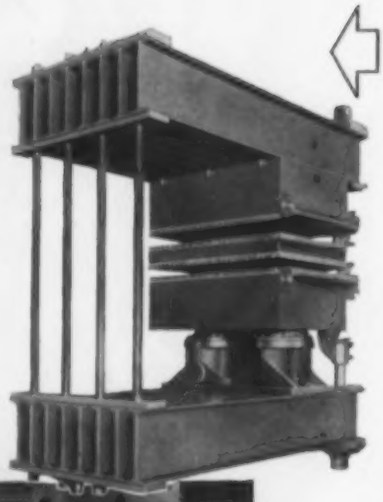


TWO-OPENING

This press has two openings permitting two lengths of belting up to 60 inches in width running in opposite directions to be cured simultaneously. It is equipped with polished platens 63 inches wide by 31 feet long. Twenty-eight rams provide pressure during the curing operation. Proper belt tension is maintained by

FLOOR COVERING PRESS

A three-opening 42" x 126" Rod-type Press with three 22" hydraulic rams. The head, platens and bolsters are continuous the full length of the press. Just the press for your floor tile and runners. Flooring may be cured in molds, or between flat, sandwich plates. A prime characteristic of this press is its versatility. Addition of stretchers makes it adaptable to belt curing,—or, cut apart, it becomes three separate 42" square presses.



OPEN-SIDE BELT PRESS

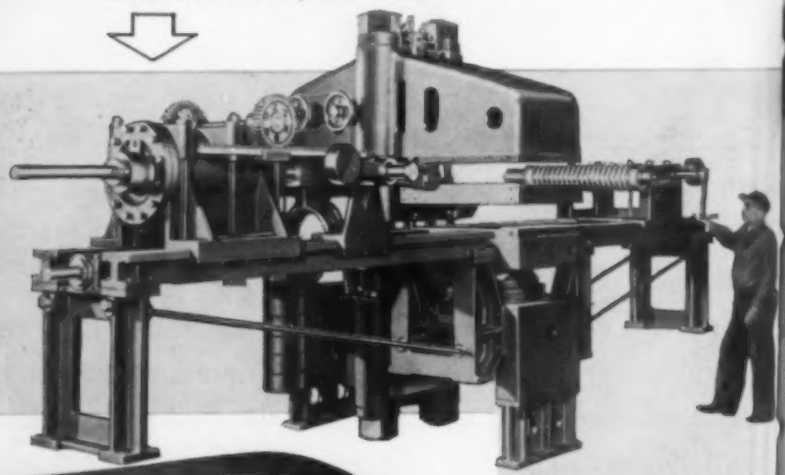
Through the use of structural beams for the head and base, with strain rods, this heavy-duty unit is desirable for the larger, more powerful open-side presses. Cold ends are built into 50" x 42" platens. The intermediate platens are held horizontal by four heavy guides traveling on turned and ground strain rods. The press is powered by two 20" rams. Excellent for curing "V" and flat belts.

One of the most important uses of the Press is the curing of endless belts. Endless belts can be put into and taken out of the Press very easily.

30" x 36" OPEN-SIDE BELT CURING PRESS FOR FLAT OR V-BELTS

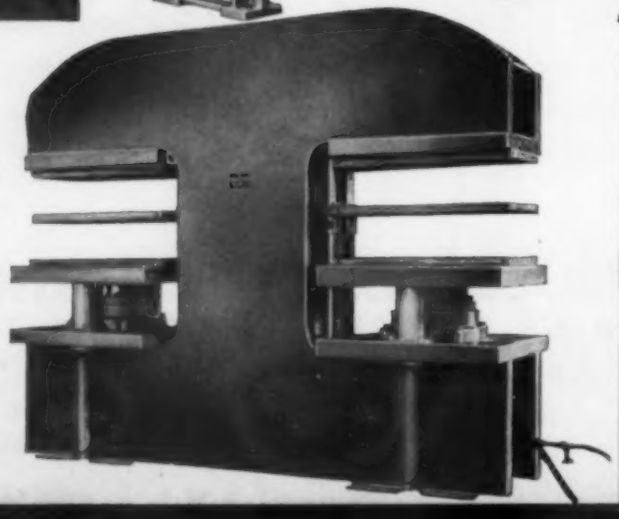
Complete with adjustable hydraulic stretcher, this press was designed and built for one of the industry's largest belt manufacturers. All platens are equipped with built-in cold ends. Intermediate platen with counter-weights, is accurately suspended and guided on ground strain rods. Overhead push-back is provided for intermediate platens and bolsters. Platens are chromium plated for flat belt curing.

Stretcher rolls are made up of steel cores and shells of aluminum grooved to the proper contour for the belts involved. Aluminum roller shells are interchangeable.



DUPLEX PRESS FOR CURING "V" TRANSMISSION BELTS

The flat belts cured on this type of press are used in all kinds of agricultural machinery and wherever flat pulleys must be driven. It is a rugged, easily accessible, economical press with fabricated steel plate housing. It is equipped with spring-loaded pull-backs for the bolster. Intermediate platen is suspended in a manner that assures operator perfect parallelism of top and bottom platens. This press is indicated where pressures are comparatively low, and is ideal for curing "V" belts, etc. Manually or hydraulically operated belt stretcher equipment is available.

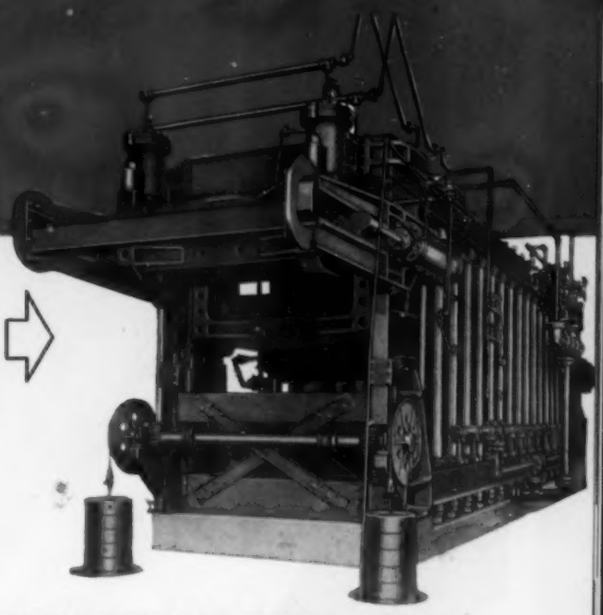


ADAMSON UNITED PRODUCTS

Mills • Refiners • Crackers • Washers • Rubber Sheeting and Coating Calenders • Plastic Film • Calenders • Calender Wind-ups • Calender Cooling Rolls • Complete Calender Accessory Equipment • Lar... Molds • Pot Heaters • Vulcanizers • Autoclaves • Hydraulic Presses • Multi-Platen Presses • Automatic Curing Presses • Be... Curing Presses • Compression Molding Presses • Plywood Presses • Auxiliary Equipment

FOR ENDLESS FLAT BELTS AND ENDLESS V-BELTS

Our latest catalog of Hydraulic Presses for the Rubber, Plastics and Plywood industries, is ready for distribution. It describes and illustrates many types of Presses not shown in this advertisement. Send for it. You'll find it interesting.



BELT CURING PRESS

means of a clamp at one end and a stretcher at the other. These are mounted on separate stands rigidly braced by heavy compression members which extend the full length of the press. The clamp holds the belt while the stretcher is hydraulically pushed away from the press to give the belt the required stretch.

An exclusive Adamson United feature is the means of raising and lowering the stretcher clamps to maintain exact alignment of the press platen surface with the adjustment clamp surfaces. This mechanical method, much superior to hydraulic synchronization, causes the clamps and stretchers to move in perfect unison with the platen, eliminating entirely the possibility of the belt bending over the edges of the platen ends during the curing process. Press can be built with one or two openings in any size, for any platen pressure.

Ram raised . . . molds closed

Molds in loading position

ALL HYDRAULIC TILTING-HEAD PRESS

Note the accessibility of this press compared with outmoded conventional types. It is simple and rugged, with 24" x 24" platens fastened to a tilting head and a tilting bolster. The platens remain parallel during the first part of the down stroke of the ram, then tilt open during the remainder of the down stroke. Unlike the Automatic Press, the molds never emerge from the Press. Toggles for opening and closing the molds have been eliminated.

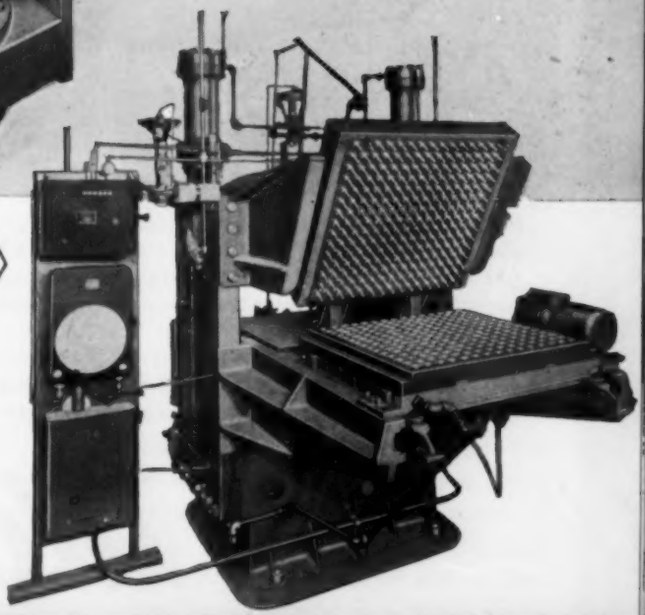
The right amount of pressure per square inch on the platens is maintained hydraulically. Wear or variable platen pressures are eliminated.

SINGLE OPENING AUTOMATIC PRESS

Fully automatic, yet possessing all the advantages of the conventional press for precision molding, this new type automatic, in many instances, has stepped up production as much as 50%.

Operation is extremely simple, with practically all manual effort eliminated. There is no more tugging or handling of heavy molds in and out of the Press. The operator has only to remove the cured articles and replace them with uncured rubber, press a button and the molds recede into the Press and close. A time cycle device opens the Press at the end of the cure and the molds open and move out of the Press and stop in a tilted position, from which the operator can easily strip the cured articles and repeat the process.

Single or double opening Presses can be furnished in this style, to take molds from 32" x 32" to 42" x 42".



Branch Offices Located at:
NEW YORK
441 Lexington Ave.
CHICAGO
140 S. Clark St.
LOS ANGELES
5140 Crenshaw Blvd.
PARIS

ADAMSON UNITED COMPANY

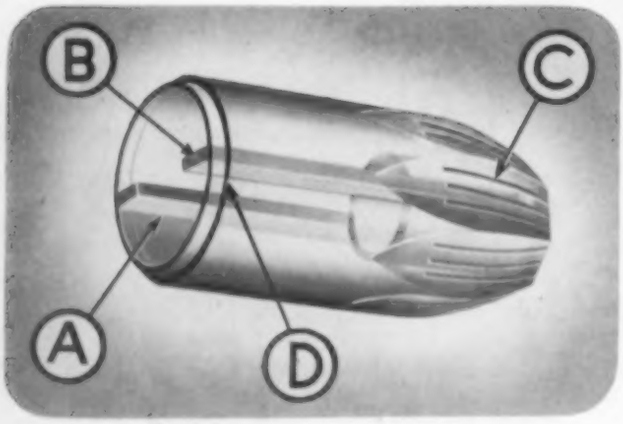
AKRON, OHIO

Handled with Plastics for EXTRA Sales

Holder-handle keeps tool bits handy... Plastics keeps them in sight

The transparent plastic tool-holder handle on this Yankee "Handyman" is one of the sales features that has captured craftsmen's fancy. Light in weight... clever design has made it strong. Good looking... modern Aico facilities produce it inexpensively.

Plastics provide extra beauty or utility... the factors which make a good product *better.* Call on Aico's skilled engineers. Let them build extra profits into your product with plastics.



Strong, transparent amber ethyl cellulose is used for this sturdy handle. A fast injection mold produces them at a rate of 5000 per day. Heavy ribs (A) with generous fillets (B) divide the handle into convenient compartments and strengthen the walls for heavy duty. Molded grooves (C) to engage splines in the mechanism housing simplify assembly. Shoulder (D) comes from the mold ready to engage the metal cap snugly with no extra operations.

There are many ways to make things better with plastics. To help you improve your product we have prepared a Portfolio showing 28 actual applications of Aico molded plastics. Send for your copy today.

AMERICAN INSULATOR CORPORATION
New Freedom, Pennsylvania

AICO PRECISION MOLDING
for over 32 years

MANY THINGS ARE BETTER BECAUSE OF PLASTICS

VOLUME 25 MAY 1948 NUMBER 9

MODERN PLASTICS

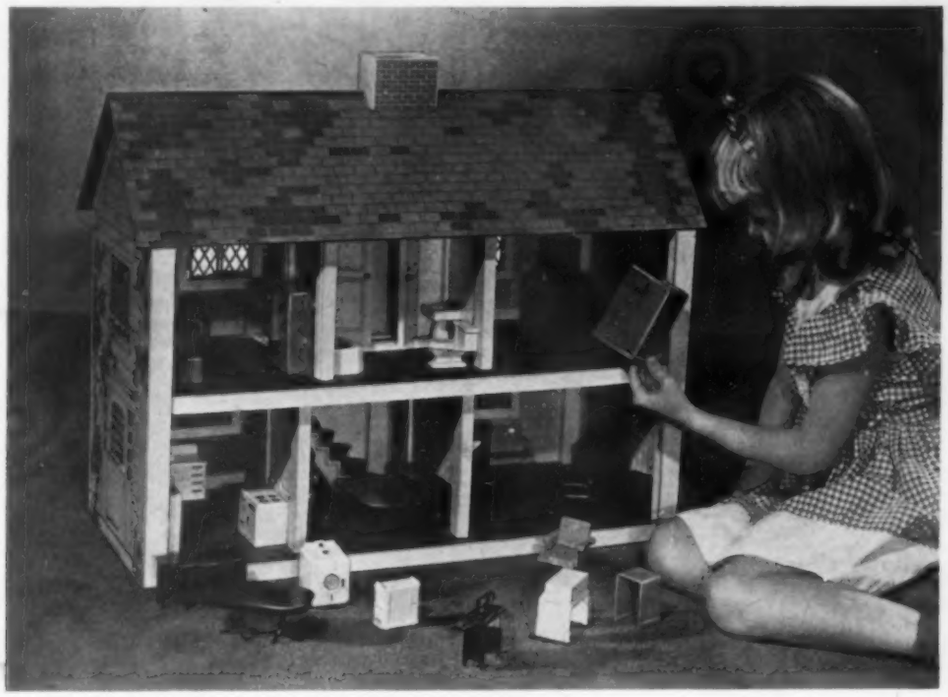


PHOTO COURTESY MONSANTO CHEMICAL CO.

Doll house is completely furnished with molded polystyrene furniture. Many of the pieces have drawers or doors which open, and all have details molded in to make them look like real furniture. Note washing machine and sewing machine in front

TOYS...

are using more plastics than ever before to make toys look more like the real thing and to fill the record demand created by 21,000,000 American children born since 1940

WORLD WAR II affected the plastics industry in many ways. One of its indirect effects was an increased market for toys—and therefore an increased market for plastics.

Largely as a result of war conditions and war-caused prosperity, the country's birth rate jumped about 40 percent. Since 1940, there have been more than 3,000,000 births a year. That means that there are now more than 21,000,000 children in the country under the age of eight. Here is the largest potential market the toy industry has ever had.

The Toy Manufacturers of the U.S.A., the industry's trade association, estimates that $250,000,000 worth of toys (at retail value) were sold in 1947, and guesses that 1948 business will total $300,000,000. Other experts call these estimates "extremely conservative." One toy buyer for a large retail organization claims that he can name 12 large chains whose combined toy sales last year totalled $221,000,000. The country's total toy business, that buyer estimates, was about $500,000,000 last year and will be about $550,000,000 in 1948.

The emphasis, however, will be on the low-priced toys. The same expert who estimates that the dollar volume of toy sales will increase 10%, predicts a 25% increase in unit sales—more toys will be sold for less money per toy, and the 10¢ to $1 field will be an extremely active one.

Plastic toys account for a large portion of the total. How large? It is virtually impossible to set a figure—partially because so many toys consist of combinations of plastics and other materials. But on one point all experts agree: plastics are an important factor in the toy industry and their share of the toy market is steadily increasing. The current trend towards greater volume at lower unit cost

Toy helicopter has strong wind-up motor to drive it along ground and molded butyrate fuselage to take the shock of colliding with walls or furniture. Rotor blades are soft rubber, for safety

Sled has top molded of wood pulp impregnated with a polyester resin. The plastic top is much lighter than wood, and much stronger. Wet snow will not affect its color

PHOTO COURTESY TWEEDIE INDUSTRIES, INC.

indicates that molded plastics will be even more widely used because long production runs always result in lowered unit costs.

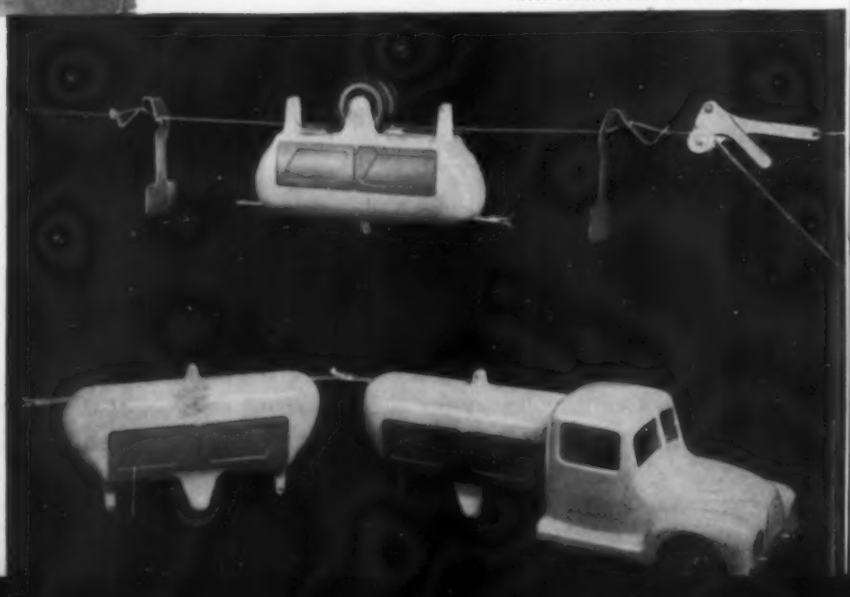
Advantages of plastics

Perhaps most important of the advantages which plastics offer to toy manufacturers is flexibility of design. Intricate shapes, uneconomical to produce in other materials, can easily be molded of plastic. In addition, molded items can include fine detail which cannot be incorporated in wood or metal toys except at excessive cost.

Another important advantage of plastics is color. Most plastic materials are available in a wide range of bright colors, and their colors will not fade, chip, or peel as will paint on wood or metal. And some plastic materials can be made transparent, a possibility which no other practical material for toys can duplicate. Glass, of course, is seldom used for toys for reasons of safety.

Three-piece polystyrene animals help teach a child color recognition, muscular coordination, and spelling. Note pegs on front part of cow in foreground and corresponding holes in inverted center piece

PHOTO COURTESY ELEC-TRICK TOYS, INC.



Flashlight batteries in one of trailer units furnish power for truck and train of trailers. Same trailer units can be inverted and used as cable cars. Motor turns on or off automatically when coupling rods hit metal stoppers on cable. Bumper of cab unit shuts off motor when truck hits an obstruction. Cab and trailers are butyrate

Other safety aspects, important considerations in toys, also favor the use of plastics. Wooden toys are likely to splinter. Metal toys often have dangerous sharp edges. But a well-designed plastic toy is difficult to break and never breaks with sharp edges. In addition, plastic surfaces are easily washed and some plastic toys can even be sterilized. That makes plastic toys more hygienic—important in toys for infants.

Lightness of weight is another argument for the use of plastics. A light toy is easier for a small child to handle. Lighter weight also means decreased shipping costs.

A more temporary advantage of plastics, and one which is not inherent in the materials themselves, is availability. Metal, rubber, and the high grades of wood needed for toymaking are all in short supply. These shortages often cause manufacturers who are used to working with other materials to try plastics. And many of them will probably like plastics so much that they will not go back to wood or metal, even when those materials become more available.

Standard applications

Because of these advantages, plastics have taken over a large part of the market for many types of toys. Some of the divisions in which they have become standard are as follows:

Infants' toys. Virtually all rattles, teething rings, and other toys for infants are now molded of plastic —usually polystyrene or cellulose acetate.

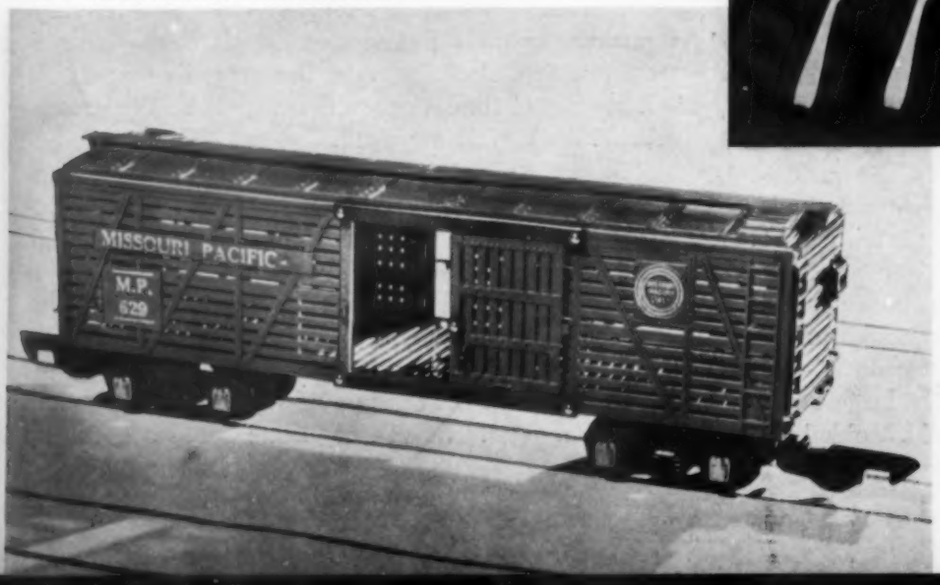
Blocks. Wooden alphabet blocks, once to be found in every nursery, are now almost a rarity. The market has been almost completely taken over by molded blocks of polystyrene or cellulose acetate. The plastic blocks are more colorful and will not lose their color or shape under the onslaughts of the teething toddler. In addition, some hollow plastic blocks contain pebbles to make them rattle, as in a set molded of Lustron by Precision Plastics Co., Philadelphia, Pa., for J. Donald Biever, Philadelphia.

A more recent improvement on this old toy standby made possible by plastics is a transparent block with a molded animal inside it. One version of this toy is the Koo Zoo, molded of polystyrene by Kusan, Inc., Henderson, Ky.

Dolls account for a substantial part of the toy business, and plastics are playing an increasingly important role in the doll business. Molded doll heads, hands, and feets, have become standard in most of the better dolls. Cellulose acetate, cellulose acetate butyrate, and ethyl cellulose are the materials most often used. A more recent trend has been towards all-plastic dolls.

Small toys. Perhaps the first foothold which plastics won in their invasion of the toy field was on the 10 to 25¢ toy counter. That important part of the toy business is still one of the strongholds of plastics. Cars, trucks, boats, etc., molded of plastic offer a

PHOTO COURTESY CELANESE CORPORATION OF AMERICA



Polystyrene toy tea set looks like real china. It is light to ship and breakage is not the problem it is with glass toy sets

Body of toy cattle car is molded of cellulose acetate. Grille-like design could not be duplicated economically in wood or metal nor could the details be molded in

Small, low-priced cars and trucks are molded of cellulose acetate. Chassis under pencil point (left foreground) is used to make cement mixer (center) or dump truck (right). Larger fire engine (at right rear) has extension ladder

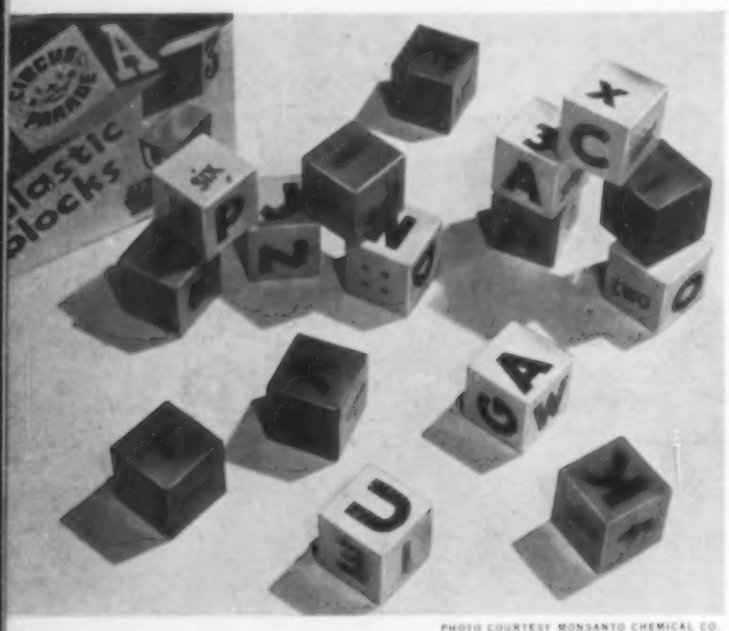


PHOTO COURTESY MONSANTO CHEMICAL CO.

Molded polystyrene blocks are light, colorful, and hygienic. Plastic blocks have virtually replaced wood

combination of low price, play value, and close resemblance to the real thing.

Examples of toys in this field are the Wannatoy trucks, fire engines, and racing cars molded of cellulose acetate by Dillon-Beck Mfg. Co., Hillside, N. J., and the see-saws, rockers, and garden swings molded of polystyrene by Thomas Mfg. Corp., Newark, N. J. To add to the play value of the latter items, the same company molds vinyl dolls which fit into the seats of the various toys.

Doll furniture. One type of plastic toy found on the 10 to 25¢ counter is important enough to be put into a class by itself. Doll house furniture molded of polystyrene has become one of the largest volume applications of plastics in the toy field. Molded chairs, tables, radios, lamps, sinks, etc., contain a surprising amount of detail. Their play value is increased by drawers which open, and even faucets which work. The furniture shown is molded by Ideal Novelty & Toy Co., Hollis, N. Y.

Electric trains. The cattle car shown in an accompanying photograph is an excellent example of one of the reasons why plastics are often used to mold cars for electric trains. The car shown is made by A. C. Gilbert Co., New Haven, Conn. The grille-like body of the car is injection molded of cellulose acetate in one piece (not including the doors and metal floor). It would be difficult and uneconomical to make a car of similar design of metal or wood.

The light weight of plastic toy railroad cars, once considered a disadvantage, has been overcome by weighting the wheel trucks so that the cars will hold the rails. Even with the extra weight, the plastic cars are still lighter than all-metal cars. Thus a locomotive which can pull six metal cars can pull a train of 14 or more plastic cars. Another advantage of plastic is that it is non-magnetic; thus electromagnetic cranes can be used to lift metal "cargo" from plastic cars.

Toy dishes. Before the advent of plastics, toy tea sets were made of glass, which was subject to breakage, or lithographed metal, which rusted. Plastics reduced shipping weights, virtually ended the breakage problem, and made possible inexpensive dishes which look like delicate, expensive china. The set shown is molded of polystyrene by Ideal Novelty & Toy Co.

Vinyl inflatables. A large market formerly dominated by rubber has now been virtually taken over by vinyl inflatable toys for the beach, the baby's bath, and the nursery.

Musical instruments. Inexpensive toy musical instruments on which simple tunes can be played are another type of toy which can be made economically only with plastics. Examples of such instruments are the ones molded of cellulose acetate butyrate by Majestic Molding Co., Elyria, Ohio, for Trophy Products Co., Cleveland, Ohio.

Records. Nursery rhymes, songs, and stories are now recorded for children on unbreakable vinyl records, or on cellulose acetate coated paper records which also illustrate the recording in color. Examples of the latter are those made by Picturtone, Inc., Brooklyn, New York.

Plastic parts. In addition to all the foregoing applications, many plastic parts are used in the manufacture of toys which are mostly wood or metal. Such an application which has become standard is the use of plastic handles on all but the lowest priced die-cast metal toy guns. The plastic, usually colored to resemble ivory or bone, makes the guns look more like the ones youngsters see in books and in the movies. The use of plastic handles opens up

new design possibilities, as in the double-barrelled pirate pistol manufactured by The Hubley Mfg. Co., Lancaster, Pa. The handles are molded of ivory cellulose acetate by Injection Molding Co., New York.

New applications and trends

A trend in toys which was perhaps made possible, or at least accelerated, by plastics is the tendency to make all toys as much as possible like the real objects they mimic. This trend extends even to 10¢ store items. One manufacturer of such toys says that he could sell a 10¢ boat a few years ago "as long as it was sort of boat-shaped." But buyers' demands for reality and detail have dictated the design of such present-day items as a tugboat which sells for only 10¢ but has bow bumper, capstans, doors, and other details molded in.

Toy makers must keep up to date on the appearance of the real thing. The white fire engine molded by Dillon-Beck Mfg. Co. is a few jumps ahead of real fire companies, most of whom are still using red engines. The toy designer knew that fire-fighting experts have predicted that white engines will be universally adopted soon—and planned accordingly.

Another example, in a slightly higher price range, is the ladder truck made by California Moulders Inc., Los Angeles, Calif. The ladder truck, molded of Tenite, and the pumper truck, molded of Styron, are scale models of real engines made by American LaFrance Foamite Corp. The two trucks, packaged in a fire-house set-up box, retail for less than $1.

Powered toys. Wind-up toys and powered toys have almost always been made of metal. The increased number of such toys made of plastics was one of the most significant trends which buyers noticed at the 1948 Toy Fair. Such toys are likely to bump into walls, furniture, etc.; therefore a high impact strength plastic is usually used.

The wind-up helicopter manufactured by Wood-

Small dolls molded of vinyl will stand or sit alone, are sized to fit in polystyrene see-saws, garden swings, etc.

Die-cast double-barrelled pistol has cellulose acetate handles which look like ivory handles on old flint-locks

Cellulose acetate numbers are weighted with metal so that 2 and 3 combined balance the weight of 5, as shown here

Toy fish are molded of polyethylene. A metal rod in bottom of each fish makes the fish float upright and makes it possible to "catch" fish with bar magnet on a string

Musical instruments molded of cellulose acetate butyrate include (top to bottom): toy flute, novelty band slide whistle, toy saxophone, and toy Sousaphone

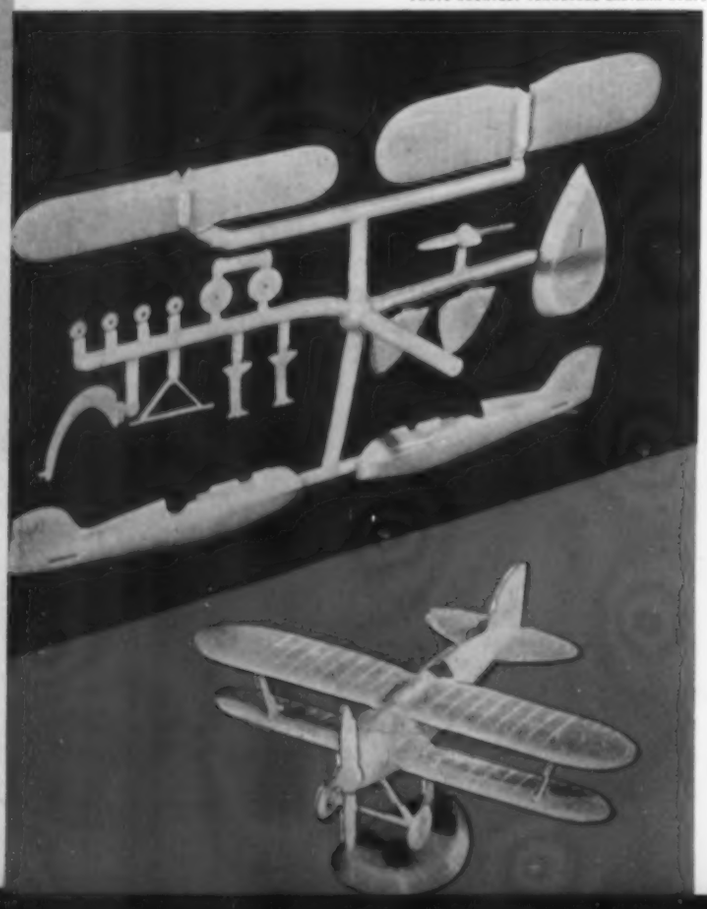
PHOTO COURTESY HERCULES POWDER CO.

PHOTO COURTESY TENNESSEE EASTMAN CORP.

Cellulose acetate ladder truck is a scale model of a real fire truck. Extension ladder is movable

Parts needed to build model plane are molded of cellulose acetate. All parts needed for plane are molded in one shot

PHOTO COURTESY TENNESSEE EASTMAN CORP.



ettes, Inc., Chicago, Ill., uses four cellulose acetate butyrate parts molded by Ger-Ell Mfg. Co., Chicago, Ill. A wind-up washing machine which will actually wash doll's clothes is molded of cellulose acetate by Ideal Novelty & Toy Co. Among the other wind-up items shown at the Fair were fire engines (some of them with wind-up sirens) and racers.

A new type of powered toy is the Air-O-Car, manufactured by Elec-Trick Toys, Inc., Utica, N. Y. The toy consists of a cab-and-trailers truck which is powered by a motor operated by flashlight cells in one of the two-wheeled trailer units. The bumper of the cab is hooked up so that it will turn off the motor when the truck hits anything.

The most original feature of this toy is the fact that the trailers can be detached from the cab, inverted, and used on a wire as cable cars. The cable cars will couple automatically and will turn off when they hit an obstruction. The designer claims only plastic was considered as a material for this toy because metal would have limited the design and would have presented problems of weight and electrical insulation. The seven plastic parts of the trailer and the one-piece cab are molded of cellulose acetate butyrate by Thermold Corp., Clinton, N. Y.

Educational toys. Another part of the toy field into which plastics are moving is the market for construction toys, kits to be assembled at home, and other educational toys. A typical home construction kit is a set of cellulose acetate parts for assembling a ¼-in. scale model of a Curtiss racing plane. The parts are molded by Hawk Model Co., Chicago, Ill.

A plastic version of a standard educational toy is the Plasti-Color Book and Re-Color Cards manufactured by the Celco Corp., Santa Monica, Calif. The cards and books have outlines of figures to be colored with crayons. But instead of plain paper, they consist of paper laminated between two layers of cellulose acetate film. Thus the colors can be wiped off and the surface reused indefinite. The same company also makes cut-out dolls and costumes.

The Loc-It-Blox, made by Emporium Specialties Co., Inc., New York, N. Y., are simply designed but they can teach color recognition, muscular coordination, and spelling. The toy consists of a number of polystyrene animals, each molded in three parts. The child can put the three parts together by matching shapes, colors, or the three letters of the animal's name—one letter on each part.

The Playskool Counting House, manufactured by Playskool Mfg. Co., Chicago, Ill., teaches addition and subtraction. The toy consists of a wood-and-metal shack and balance, and a set of hollow numbers, each molded of Tenite in two pieces. The numbers are weighted with die-cast metal so that their weight is proportional to their numerical value. Thus the 2 and 3 combined weigh as much as the 5; the 4 and 6 weigh as much as the 10; and so on. The child checks his addition by weighing the numbers.

Varied materials. In addition to polystyrene and cellulose acetate, which are already widely used in toys, other plastic materials are becoming important factors in the toy field as manufacturers learn about the versatility of plastics and the wide variety of plastic materials available. A number of toys molded of cellulose acetate butyrate have already been mentioned. Both this material and ethyl cellulose are being used more and more often in higher-priced toys. Vinyl is important in the manufacture of dolls, as is also ethyl cellulose.

Polyethylene is destined to find an important place in the toy field because it offers qualities which no other plastic material possesses. Its ability to float led to its use for molding Freddy Fish, a new version of the old magnetic fishing toy. This toy, manufactured by Van Sciver Products Co., Philadelphia, Pa., has one advantage over its paper and metal predecessors: the fish will actually float upright. Other toys which make use of the light weight or flexibility of polyethylene are bound to come.

The laminates also seem destined for a share of the toy market, especially in the larger wheel goods—express wagons, cars children can ride in, etc. Hobby horses made of a low pressure laminate have been on the market for years.

Last winter saw the debut of a sled with a top molded of wood pulp impregnated with a polyester resin. The sled was designed by Engineering Associates, St. Charles, Ill., and manufactured by Tweedie Industries, Inc., Chicago, Ill. At the recent Toy Fair, a cellulose acetate propionate toy diver was introduced. There were also fabricated acrylic toys for toddlers to push around.

Buyers must learn

To toy buyers, the names of these plastic materials mean but little. One well-known buyer estimates that not one out of 100 of his colleagues knows one plastic from another. The same buyer admits that he knows practically nothing about plastics himself, but he knows that he will have to learn.

He and his colleagues will have to learn about plastics because it is becoming increasingly difficult to buy toys intelligently without some basis on which to judge the good applications from the bad. Until buyers do learn, there will be misapplications. But they will be offset and outnumbered, as they are in every other field, by the intelligent applications—the use of the right material to do each job. And intelligent applications mean better toys . . . and more plastic toys.

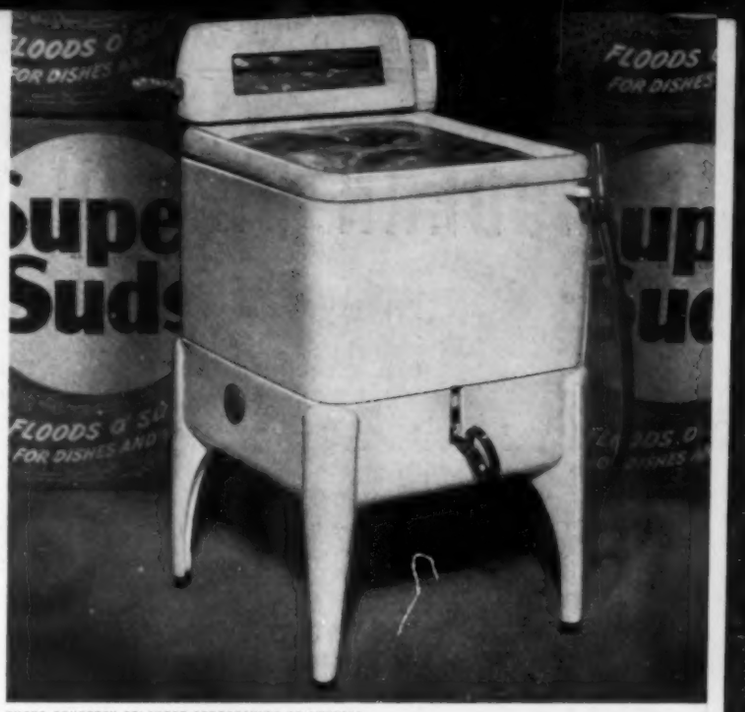


PHOTO COURTESY CELANESE CORPORATION OF AMERICA

Washing machine has wind-up spring motor, will actually wash doll clothes. Machine is molded of cellulose acetate

Nursery rhymes and songs are illustrated in bright colors and recorded on cellulose acetate-coated paper records

PHOTO COURTESY HERCULES POWDER CO.

MODERN DESIGN WITH BASIC PARTS

Primary housings, electrical components, and bezels, molded of phenolic are assembled into a broad range of electrical testing instruments

AGGRESSIVE imagination in the use of molded phenolic parts is being applied by one of the nation's leading manufacturers of electrical testing instruments. Company executives and technicians of Simpson Electric Co., Chicago, Ill., not only like the way the phenolic parts, with their desirable electrical properties, help in turning out more accurate products; they also appreciate the smart, modern designs which molded plastic parts afford them. But over and above these more obvious factors, the company has found that in working with molded phenolics, it can case a wide range of testing instruments with a relatively small number of basic molded parts.

This important objective has been attained by so designing the line that a single type of case will fit several different instruments. Panel faces, having their own individual molds, are combined with primary housings, electrical components, and molded bezels to form finished instruments.

Among the Simpson instruments in which molded phenolic parts are used are combination volt-amp-wattmeters, high sensitivity set testers for radio and television servicing, several types of tube testers, signal generators, and a complete "family" of small matching Micro-Testers, used as basic tools in service shops, laboratories, schools, and industrial plants. In addition, Simpson produces a number of round and rectangular panel instruments in many case sizes and styles.

As the number of models in the Simpson line mounted, the volume of molded plastics expanded progressively. This growth, coupled with the high accuracy required for parts of this kind, eventually led to the setting up of the company's own compression molding facilities.

Molded-in lettering

According to Simpson executives, there are a number of reasons for the organization's steadily increasing list of plastic applications. For example, much of the usefulness of electrical measuring instruments depends on the legibility of the various settings on the panels. With molded phenolic parts, the readings, model number, and other data are molded directly into the parts, and white enamel is wiped in to make the readings stand out sharply against the rich black cases and panels. This eliminates such operations as printing or screening, and also provides readings which will stand up.

The strength of the phenolic material and the fact that it provides excellent electrical insulation are other factors influencing its specification in these instruments. General purpose phenolic is the type customarily used, although certain applications call for low-loss mica-filled material. The insulation angle is doubly important, not only influencing the accuracy of the instrument, but also making it a much safer piece of equipment to handle. In the Simpson Model 260 high sensitivity set tester for television and radio servicing, for example, a maximum of 5000 volts may be passing through the instrument at times. Since there are no exposed metal parts which the operator might contact, the danger of accidental shocks is reduced to a minimum.

Use of molded plastic components in the instruments also eliminates the need for extensive fabrication of sub-assemblies in putting together the intricate working parts of the meters and other items. In the molding process, it is possible to handle all recesses, inserts, and other details required to insure a rugged, quickly assembled instrument.

The Model 260 instrument, mentioned above, is a case in point. This model, which was introduced several years ago and quickly established itself as the leading instrument of its type, has recently been made available in an optional version with a roll top safety case. Here the company takes the standard Model 260 and fastens it permanently within a housing of molded Durez phenolic, making the instrument and case a single unit easily carried by means of the leather handle. Slats comprising the roll top are of black butyrate, accurately aligned on a strip of pressure-sensitive cloth tape; the top slides smoothly up and down in grooves molded into the side panels of the outer case.

The compact sub-panel assembly of this instrument, molded of phenolic, provides tiny recesses as separate pockets for the resistors. This separation of resistors makes for orderly assembly, high accessi-

Upper left: Radio test meter Model 260 with open panel. Top center: Similar instrument with roll top case. Upper right: Roll top unit open. Foreground: Molded phenolic components of instruments. Moon-shaped part is fabricated; roll top has butyrate slats

bility, and added insulation for preventing shorts. All connections are short and direct, eliminating the need for cable wiring. Each battery has its own easily accessible compartment.

Characteristic of the amount of thought devoted to the design of Simpson instruments is the manner in which the jacks at the bottom of the front panel are recessed as an extra guarantee of protection against accidental shock. Before an electrical contact can be made, the jack plugs must be deliberately inserted into these protected openings.

The Model 390 volt-amp-wattmeter and the Model 240 volt-ohm-milliammeter are but two of a family of approximately a dozen instruments in which a basic molded case and dial bezel are used in combination with an individual engraved panel to form the complete instrument. Assembly is by means of screws from the back. This arrangement makes possible important production economies, insures accuracy because of close supervision of mold production and actual molding, and produces an attractive line of instruments which may be successfully merchandised as a group.

Illuminated meters

A highly functional use of thermoplastic as well as thermosetting materials is found in the rectangular illuminated meters produced by Simpson. These

Right: Molded phenolic instrument subpanel, with separate pockets for resistors and battery. Electrical parts are readily accessible

PHOTOS COURTESY SIMPSON ELECTRIC CO.

Left: Radio test unit, Model 240, with three molded parts which show the construction of the case. Lettering on panel has not yet been wiped in. The three parts at the right of the photo are used in illuminated meters. The clear acrylic part pipes light to the face of the instrument

Tube tester Model 330 has large panel 3/8 in. thick. Metal shrink fixtures are used to maintain accuracy

meters are indirectly lighted from the back by means of a small bulb, the actual illumination being piped to the face of the instrument through a molded acrylic ring into whose recessed back the bulb extends. This piece is combined with phenolic case parts in the finished instrument.

Certain Simpson instruments, such as the Model 445 plate conductance tube and set tester, include large front panels of molded phenolic involving a number of interesting details. The panel for the Model 445, for example, measures 15 by 9 in. and is $\frac{3}{8}$ in. thick. The amount of mold engraving necessary to produce this panel with molded-in markings is readily apparent in an accompanying photograph. Similar panels for the Models 330 and 335 are molded in the same yoke with different cavities and punches.

This panel is molded on a 200-ton Stokes press at a rate of about five shots per hr., using loose powder. To insure against drifting, it is the practice in the Simpson molding shop to use threaded insert pins on all jobs. Although it takes a little longer to screw the inserts on the pins, experience indicates that this practice holds the inserts flat against the punch and causes them to come out exceptionally clean. In the event of pin breakage, quick replacement is facilitated.

The full complement of compression presses in the Simpson molding department includes one 50-ton press, two 150-ton presses, one 200-ton model, and a 15-ton fully automatic press. The company is considering the installation of preheating equipment to speed up cycles and is also planning to install a 4-oz. injection press to meet its requirements for thermoplastic components.

Because of the wide variety of models which it markets, the company has its own tool room, which works in close conjunction with the molding department. To maintain the high degree of precision required for its phenolic parts, the company gages critical parts directly at the press to a tolerance of 0.005 inch. Metal shrink fixtures are employed on even the smallest phenolic components.

Air Conditioning Grille

Filtered air can be directed by finger-tip adjustment of round cellulose acetate butyrate grille which is molded in one piece

AN ADJUSTABLE plastic grille contributes largely to the beauty and utility of the new home air conditioner shown on this page. Monitor Equipment Corp., Riverdale, N. Y., markets the unit. The one-piece grille is molded by Sterling Injection Molding, Inc., Buffalo, N. Y., of cellulose acetate butyrate supplied by the Tennessee Eastman Corp.

The air conditioner unit is useful in either summer or winter. In summer, air is taken in through the open window, cooled by refrigerant coils, and dehumidified. The controls can also be set so that the conditioner will humidify and recirculate inside air.

In either case, the conditioned air can be directed upwards, downwards, or to either side by simply turning the grille so that its louvers divert the air in the desired direction. The grille fits into a circular opening 9 11/16 in. in diameter. Over-all diameter of the grille is 9 15/16 in.; a ⅛-in. flange covers the opening.

Problems in design

Designing the mold for the grille was a problem because of the numerous thin sections in the piece and the angles of those sections. It was also important to avoid flash between the louvers, which would have necessitated an expensive finishing operation.

Butyrate was selected as a material for the grille so that the thin sections would be slightly flexible rather than brittle. The material has low thermal conductivity, therefore it does not tend to sweat on humid days. It is also corrosion-proof, and pleasant to the touch at all temperatures. Because of the acoustical qualities of butyrate, the grille does not vibrate.

Since the grille is molded in brown material to match the color of the air conditioner cabinet, the entire machine is one neutral color which will blend harmoniously with practically any home furnishings.

The self-contained air conditioner, sized for conventional windows, is easy to install and economical to operate on the regular house-lighting circuit.

The manufacturer is so well satisfied with the butyrate grille that the same design has been adopted for another model air conditioner. The newer grille is also butyrate and is about 1½ in. larger in over-all diameter.

Brown butyrate grille matches air conditioner cabinet. Grill is corrosion-proof, does not sweat in humid weather, and is always pleasant to the touch

West Coast Conference S. P. I.

The annual conference and exhibits of the West Coast Section, Society of the Plastics Industry, was held at Santa Barbara Calif., March 28-31. Abstracts of some of the principal papers read at that conference are presented here.

MARKET POTENTIALS FOR PLASTICS

by William T. Cruse, vice-president, Society of the Plastics Industry, Inc.

THE impressive growth of the plastics industry in the last 10 years proves that plastics have been doing well in the market place. But the strides have been made under the favorable trade winds of a sellers market. The industry has been able to absorb the shocks of its mistakes without pain.

The consumers' representative, the retailer, is becoming a more discriminating buyer. The time is coming when all merchandise may be tested by the retailer in his own testing laboratory before he buys.

The production and processing of unsupported and supported thermoplastic film has grown more than any branch of the plastics industry within the past three years. This represents an annual volume of $50,000,000 at today's rate of production. There will undoubtedly be further expansion in this field.

Woven extruded monofilaments will find more applications. The cotton textile business in 1937 totalled $3,750,000,000. If plastic textile applications do only 10% of that, the volume will be $375,000,000. There should also be increased applications of film in packaging.

There is a good future for plastics in the tableware field, now that melamine has proved satisfactory for this application. There is a backlog demand, as a result of the war, in restaurants and hotels for $40,872,000 worth of china. The normal annual demand for all uses, including home, is for some 50,000,000 dozen pieces worth $58,000,000. If the plastics industry manages properly there isn't any reason why it shouldn't enjoy a good share of this business.

Those who were in the industry in the '30s will recall the importance of the premium market to many molders. Plastics should get a good part of the $500,000,000 which it is estimated will be spent for premiums this year.

To an increasing extent from now on our industry will be affected by the economic vicissitudes which affect our national economy. With an increasing number of applications of all types in all fields, plastics are becoming more inextricably woven into our economic pattern. When the national income retreats from its present level of $200,000,000,000, the recession will be felt by the plastics industry. To offset this, the industry will have to expand through material and process development and the discovery of new applications.

HOW DO WE GO FROM HERE?

by Charles J. Romieux, American Cyanamid Co.

SINCE the end of World War II, the capacity of the industry to produce almost all raw materials has been more than doubled, based on rated capacity in 1941. Somewhere in the neighborhood of $175,000,000 has been spent by the plastics industry for building and equipping new facilities, and many additional millions have been spent by molders, laminators and fabricators. In order to receive an adequate return on this investment we must seek new markets, create new products, and devote a larger portion of our efforts to selling the industry's rated output.

A large portion of the plastics industry's output consists of component parts rather than finished products. Too few of us have spent time and effort looking for the weaknesses of existing products, studying cost factors, comparing quality, and in general analyzing the products of American industry in order to determine which might better be made with a plastic.

Each member of the plastics family has a unique combination of properties which is not duplicated by any other plastic or any other material. We don't really sell a given plastic—rather, we sell the properties of the articles which can be made from the plastic. Often it is not the best known property which is responsible for the application of a plastic in a given product.

The choice of any material involves a compromise, and there is certainly no reason why a plastic should be expected to be the perfect material for an application before its use is considered. Window glass is heavy and hard to handle. It will break when subjected to a sharp blow and when it breaks it shatters. Still, it is universally applied because it is transparent, hard to scratch, and extremely durable as far as weathering is concerned. If we can bring this point to the attention of our prospective customers and overcome the fallacy of their seeking a potentially perfect material, much of our sales resistance will be overcome.

We must influence potential customers to consider the changing trends, new economic conditions, and the increasing demands which the public is making on all manufacturers. A good example of a changing economic condition is the greatly increased cost of labor during the last 10 years. We know that both molded and laminated surfaces are extremely durable and eliminate a considerable amount of cleaning and redecoration cost. While it may have been uneconomical to use a plastic surface 10 years ago, it is entirely possible that today's high labor costs for maintenance and repair may indicate the necessity of a plastic material even though its initial cost is greater than a supplementary material.

THE MOLDING OF NYLON

by Walter E. Rahm, E. I. du Pont de Nemours & Co., Inc.

A DOZEN different nylon molding compounds are now in production, either commercially or on a semi-works scale. An all-purpose type of nylon molding powder most generally in use today is FM-10001 composition for injection molding. This compound offers unusual toughness, high service temperature, in some cases as high as 380° F., and form-stability. Its service temperature greatly exceeds that of other moldable thermoplastics and permits sterilization by steam.

(*Please turn to page* 174)

WRAPPED IN PLASTICS FILMS

FIRST OF A SERIES OF THREE ARTICLES ON PLASTICS IN PACKAGING

by WILLIAM F. CULLOM

A REVOLUTION in retailing began with the introduction of transparent film, both regenerated cellulose (cellophane) and cellulose acetate, 20 years ago. That revolution involved a change in display methods, a change in selling methods, and a change in store systems. It was all based on the fact that the sense of sight controls at least 87% of our impressions and 85% of our deliberate movement.

The change in display methods was from hidden stock to open display which permitted the customer to buy on "impulse" products that she had not intended to buy. Out of this change grew the groceriteria and the supermarket where today at least 40% of unit sales are "impulse" sales.

The change in selling method was from service by clerk to self-service by the customer from open display tables and manifested itself also in the variety chain stores and in many sections of department stores.

The change in store systems was from hidden pricing to open pricing, from long-winded discussion to informative labeling, from yearly inventory to perpetual inventory. It brought time-motion study to the retail field, it speeded up transactions, and it placed more responsibility for retail volume on the manufacturer.

In the first decade of this revolution in packaging and merchandising, the main purpose of the plastic film was to protect the packaged product from dust and abuse through handling and to permit it to be seen clearly through the film. But, when fresh foods, tobacco, tarnishable or rustable metal products, and other items affected by moisture vapor came to be so packaged, the field was opened for specialized films with specific properties such as barriers to moisture vapor, gas, and even ultra-violet light. Further, when the necessity for high speed machine packaging with heat sealing appeared, the scope of the responsibility of plastic films increased many fold.

Specific qualities

These plastic films, made from a variety of resins and combinations of resins—extruded, calendered or cast—are today accepted by the public without thought: each of them is accepted as suitable packaging for individual products by manufacturers only on the basis of specific qualities. So we find tobacco put up in a vinyl chloride pouch, margarine packaged in a specially compounded vinyl container that holds a gelatin color capsule for easy coloring of the margarine by kneading, vacuum-packed bacon in an envelope made of laminated plastic film, dried cereals and fruits in boxes with see-through windows made of cellulose acetate film, liquor labels made by laminating acetate film to paper, and countless other examples. Two of the largest frontiers of packaging—soft goods and fresh foods—are being exploited by the commercial availability of cellulose acetate film.

In the soft goods field this material is used in hosiery bags, envelopes, and box wraps. It is non-blocking and non-wrinkling, and is used for such items as men's shorts, undershirts, and hosiery, and

The Author: **William F. Cullom, director of sales, Transparent Films Dept., Celanese Corporation of America, has, in his relatively short career, built quite a reputation in the plastics, molding, and packaging fields.**

Newly appointed chairman of the Advisory Council of the Packaging Institute, Mr. Cullom was born in New York City in 1909, "prepped" in Montreal, and graduated with a B. S. from St. John's College in Annapolis. He joined the plastics division of Celanese Corporation in 1936, and spent two and a half years in packaging sales in the Philadelphia area. He was switched to molding materials in Chicago and, for four years, covered the midwestern states handling cellulose acetate sales and engineering.

In 1943, Mr. Cullom came to the New York office of Celanese to head what is now the transparent films division, and has become recognized as one of the authorities on the prepackaging of fresh fruits, vegetables, and meats. He has also developed a method of heat sealing thin cellulose acetate film.

PHOTO COURTESY DOW CHEMICAL CO.

Processed meats such as bacon and dried beef are now being packaged in saran on specially adapted automatic equipment

PHOTO COURTESY CELANESE CORP. OF AMERICA

A clear Lumarith wrap printed in blue, white, and black by the Dobeckmun Co., provides an attractive package for Lily-Tulip Cup Corp.'s unit of eight waxed cups and lids. The wraps are sealed with a solvent cement and the ends tucked into the cups. This keeps the cups untouched and dust-free, and lengthens shelf life

PHOTO COURTESY C. ZOELLNER & CO.

Polyethylene tubing at right, made by Plax Corp. and heat sealed at the ends, is used to package an entire line of brass fittings. Its transparency insures readability of the insert cards which give firm name, and data on parts

women's lingerie and handkerchiefs. Heavier weight soft goods are put up in window boxes with laminated wraps. Leading haberdashery manufacturers now protect and display their lines with cellulose acetate film laminated in folding window boxes.

"Breathing" wrap

The bagging and overwrapping of fresh fruits, vegetables, and meats—the other frontier mentioned above—demands what has come to be popularly known as a "breathing" wrap. By "breathing" is meant that a material allows for the free passage of water vapor, carbon dioxide, oxygen, and other gases in and out of the package. This function has an important bearing on the produce's palatability, color, and freshness. For the most part, fresh produce needs refrigeration from the moment it is harvested until ready to eat. It also requires care in handling to prevent bruising and abuse. Tomato overwrapping, spinach bagging, and celery wrapping are only a few of the hundreds of such applications.

Cellulose acetate is receiving much attention in the packaging of red and other meats. It is not necessary to have too high a temperature when heat sealing the material and there is no softening or blocking of the film in storage. It remains crystal clear and non-fogging under refrigeration and it is unaffected by animal juices and resists fats. Smoked and processed meats, such as bacon, ham butts, scrapple, and frankfurters, have been packaged in this film for many years.

Low physical strength is a shortcoming of cellulose acetate film in meeting pre-packaging requirements. Here, as in the case of molding powder selection, the buyer has an ideal from which departures may be made in specifications to use thicker films or laminations in some cases where high strength is required. The economy of cellulose acetate is not forced by

the material makers in cases where another film will do the job better.

Heat sealing now possible

Cellulose acetate film, up to mid-1947, had a more serious shortcoming: it couldn't be heat sealed. For a long time the difficulty was that, being thermoplastic, it softened and stuck to the metal of a heat sealing element before sufficient heat had passed through the film to seal the inner surfaces. It has now been demonstrated that hand heat sealing at temperatures between 365 and 390° F. will seal one manufacturer's cellulose acetate film and, undoubtedly, this principle will apply to any acetate.

Since hand heat sealing is often performed on elements without any heat control, it is recommended that, in sealing acetate, a Silicone resin be used as a lubricant for the heating element. Dow Corning's high vacuum grease, its paste DC7, and the same company's mold release solution, DC703, have both been used successfully. Tetrafluorethylene covering on the elements will accomplish the same thing but its abrasive resistance in film form is poor and maintenance becomes expensive.

Automatic machine heat sealing of cellulose acetate is definitely on its way. Research and field work is being done and results are anticipated this year. The proper heat or combination of heat control and lubricant, looks like the answer from here.

Although cellulose acetate film is the volume item in today's packaging picture, many other transparent plastic films are developing new and broader markets. Cellulose acetate butyrate, for example, which is very similar to cellulose acetate, offers additional tensile strength. Although only small amounts of this film have appeared on the market, spinach bags of this material appear to be stronger.

A wrapping of clear Lumarith sheeting retains all the freshness, palatability, and natural color of vegetables

Ethyl cellulose in gages of 0.005 to 0.002 is a film to watch. It has approximately the same water vapor transmission as cellulose acetate, but it offers higher oxygen and carbon dioxide transmission, and has strength to spare. Both laboratory and field tests run to date on the small pilot plant production available show this film to be an excellent dimensionally stable, breathing transparent material. In applications where strength is an important factor such as in packaging oranges or heavy meats, its manufacturers believe it will be popular. For applications where strength is paramount, ethyl cellulose holds great potential possibilities. According to field reports, heavier ethyl cellulose film has a considerable advantage in ease and quality of printing.

Another packaging film, not a true plastic, but listed with the plastics, is rubber hydrochloride, a tough, elastomeric, waterproof, and highly water-vaporproof and gasproof material. It was used for the packaging of pickles in brine before the war. During the war years, uses which consumed thousands of pounds of rubber hydrochloride were developed, among them "Method 11" packs in which heat sealed bags were used to package motors, airplane engines, etc.

Moisture loss prevented

In today's retail market, rubber hydrochloride is performing many packaging functions for which it is especially fitted. For example, the packaging of cheese has always been a challenge to any material, but rubber hydrochloride has served well. It can be used in contact with some types and permits natural aging while inhibiting the formation of rind.

Because this film prevents moisture loss during storage and sales life, it is selected by some dried fruit manufacturers since it is important that these fruits retain a definite amount of moisture. One fruit packer, for example, California Package Corp. (Calpak) uses it for wraps on its pressed bricks of figs, prunes, and other dried fruits. Besides dried fruits, another group that needs moisture vapor protection are frozen foods which at low storage temperatures tend to dehydrate. Although rubber hydrochloride becomes quite stiff at low temperatures, its low water vapor transmission rate creates interest in the frozen food field. However, the product is handicapped by the limited number of high speed packaging machines equipped to handle this elastomeric wrapper.

Wide variety of vinyl

The vinyl films, production of which has been expanded tremendously in the past few years, are daily gaining greater stature in the packaging field. Because of the many copolymer and plasticizer combinations a large variety of films can be produced, ranging in type from hard, brilliant films to soft, flexible films approaching silk. These materials generally are noted for their ability to take abuse,

their excellent standards of serviceability, and their lack of odor, taste, and toxicity.

Perhaps the most popular application of these vinyl films has been in the heavier gages used for rainwear, shower curtains, and pocket books. These slightly translucent elastomers are a good material for dress and suit containers, and nearly all variations of them appear somewhere in the packaging picture.

Polyvinyl chloride-rubber nitrile combinations which play their part in packaging are tough, chemically inert, and for the most part, non-toxic and odorless. These calendered films vary in thickness from 0.001 and up. To achieve a gage thinner than 0.004, polyvinyl chloride is calendered and subsequently stretched to the desired thickness but not often below 0.001.

Vinyl films permit strong heat seals, although here, as in the case of cellulose acetate, precautions should be taken to prevent sticking to certain types of heating elements. Adhesive or solvent sealing is sometimes used for intricate shapes. Electronically heat sealed edges on tobacco pouches, for example, are highly tenacious, enabling the unit to withstand a tremendous amount of handling and use.

Frozen chicken wrap

More meat packaging news is being made by a specially polymerized vinylidene chloride polymer being used to package frozen chickens and turkeys. This material differs from the normally encountered vinylidene chlorides in that it is odorless and tasteless. After the fowl is dressed, it is placed in a bag of this material and a partial vacuum is pulled. The bag is then sealed and immersed in hot water. The package shrinks to a tight fit around the bird's contours. The low water vapor transmission precludes dehydration on freezing and the lack of air between the close-fitting wrap and the fowl minimizes the possibility of freezer burns.

Saran (vinylidene chloride) films are available in sheet form from 0.0005 to 0.002, and in seamless tubes from 4-in. flat width through 32-in. flat width. Dow Chemical Co. is the sole maker of saran, which has a folding endurance of over 500,000 folds; is quite resistant to puncture; good printability; a low water vapor transmission rate; and a low gas transmission rate. The strength, chemical inertness, and excellent aging properties of this film make it an ideal material for bag or drum liners in shipping chemicals, as bag material for shipping engines which might rust and, indeed, for shipping any machine part.

Saran Film 517 is used in the packaging of natural cheese, in cap liners, and in laminations to foil and paper. It is used also in the packaging of dried fruits such as apricots, peaches, prunes, and figs, where these materials are put up with moisture included.

Biggest problem to date in the application of Saran Film 517 to packaging has been its critical heat sealing temperature of 280 to 300° F. and the fact that

Impulse buying of colorful dried fruits is boosted by these saran bags, envelopes, and film covered paper trays

standard equipment for packaging with conventional films will not handle it well, since most such equipment pushes the film through while saran film must ride through. Dow is currently developing changes in several types of standard packaging equipment to accommodate Saran Film 517. Methods and speeds of feed, heat sealing temperatures, frequency adjustments for electronic sealing, and other problems are rapidly being worked out. It is Dow's intention to turn over to the machine manufacturers and converters their findings on the equipment problem, their plans for reconversion of existing equipment, and plans for the development of new equipment.

Extreme toughness

Polyethylene, a relatively new film development, is semi-transparent, strong, elastomeric, and has a fairly low water vapor transmission rate and good-to-excellent gas transmitting qualities. This is a valuable film where waterproofness, chemical inertness, and low levels of odor and taste are important.

In general, polyethylene is characterized by its extreme toughness and rubberiness and its excellent electrical properties. Current production of the film cast from solution is lightly cloudy; film that is calendered is translucent. Polyethylene is also extruded as sheets or in tubes and then fabricated into bags.

Because of polyethylene's exceptional strength, it was a natural choice for the redesigned package and sales techniques of E. Edelmann & Co.'s brass fittings. Edelmann, using specially designed equipment, flame-seals its own polyethylene envelopes which are used in conjunction with a custom-molded transparent polystyrene stock drawer developed for jobbers. The application has changed a costly, count-

PHOTO COURTESY MODERN PACKAGING

A vacuum process makes the Cy-O-Vac vinylidene-type copolymer bag fit tightly around this turkey

PHOTO COURTESY BAKELITE CORP.

To protect fine blankets before and after sale, this Vinylite bag with a zipper opening is made by Clarvan Corp. and used as a package by Swarthbaugh Mfg. Co.

out selling job into a fast, economical, and efficient merchandising procedure.

The polyethylene envelopes provide complete product protection, allow correct identification as to size and material contents, and permit a jobber to stock in the same amount of space three to four times as much inventory as was possible in former packages. Inventory problems are greatly simplified. The polyethylene used in the Edelmann job is fabricated from continuous rolls of 0.005-in. polyethylene tubing, 2½ in. in diameter and supplied with a slight yellowish cast which gives the brass parts maximum display value. The machine used is completely automatic and produces the seven lengths of envelopes required for the line. It takes a 500-ft. roll of tubing, drawing the plastic to a position where a flame-sealed joint is made. The envelopes are then sliced off and ejected by means of an air jet. Maximum production is 1600 bags an hour. Both hand and semi-automatic flame-sealing are used to obtain closure on the filled envelopes.

The manufacturers and extruders of polyethylene film are naturally tremendously interested in the fresh food market as a potential sales field. And the physical and chemical properties of this composition are not approached by many competitive films now known to the industry.

New laminates under test

Combinations of practically all the films discussed so far have been made with all types of paper, cloth, metal foils, and other materials for both decorative and utility containers. Two truly newsworthy laminations, one of rubber hydrochloride and cellulose acetate, and the other of polyethylene and cellulose acetate, are undergoing initial field tests. In these combinations, transparency, unusual strength, and a marked ability to contain gas and water vapor have been discovered.

The vacuum packaging of bacon is also under test. Hygroscopic pharmaceuticals and other materials that require a strong, relatively gas and water impervious package are potential outlets for this type lamination packaging. Cheese, peanuts, and coffee, to name a few, are all either being packed commercially or undergoing serious field trials right now.

As was mentioned in the introduction to this article, the merchandising revolution which depends on packaging has been going on for 20 years. Its pace since V-J Day has been accelerated. New packaging materials and methods developed during the war have come into common commercial application. In the films, new formulations are being worked out; new machine methods of using them in packaging are shaping up. Because of this, almost as much has happened technically in the past 2½ years as happened in the decade preceding the war. It is no longer necessary for a manufacturer who desires to use film packaging to "make do" with something less than optimum quality, since with the variety and range of plastic films available today, he can tailor-make his package to his product and his market.

The present period of jockeying between films is one of slowly determining over long periods of use tests the best film for each type of application in each market. As far as the impact of film packaging to merchandising is concerned, costs are in almost direct relationship to combinations of quality desired.

Besides which, this kind of packaging pays for itself!

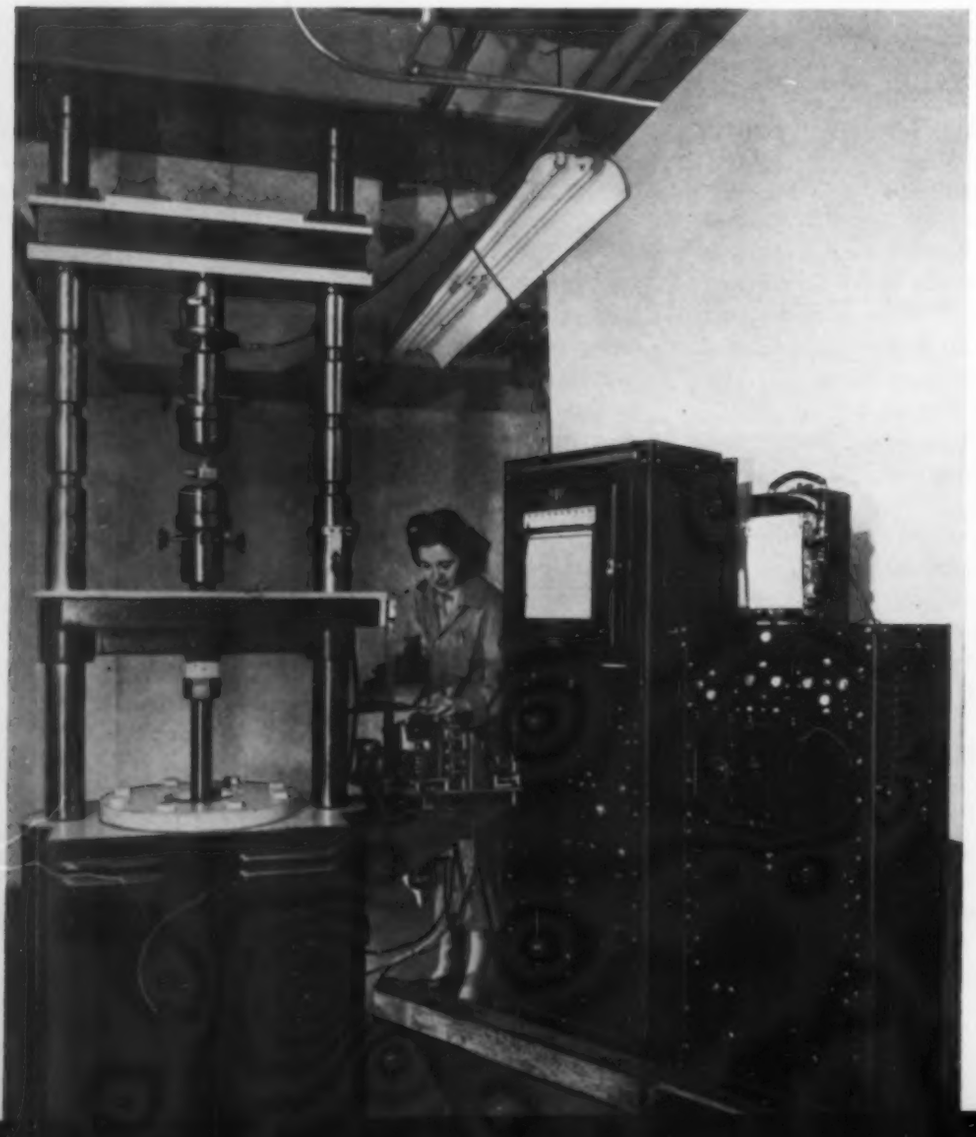
Testing for Better Plastics

A research program now underway will provide more accurate data for engineers; it may even result in the development of new plastic materials

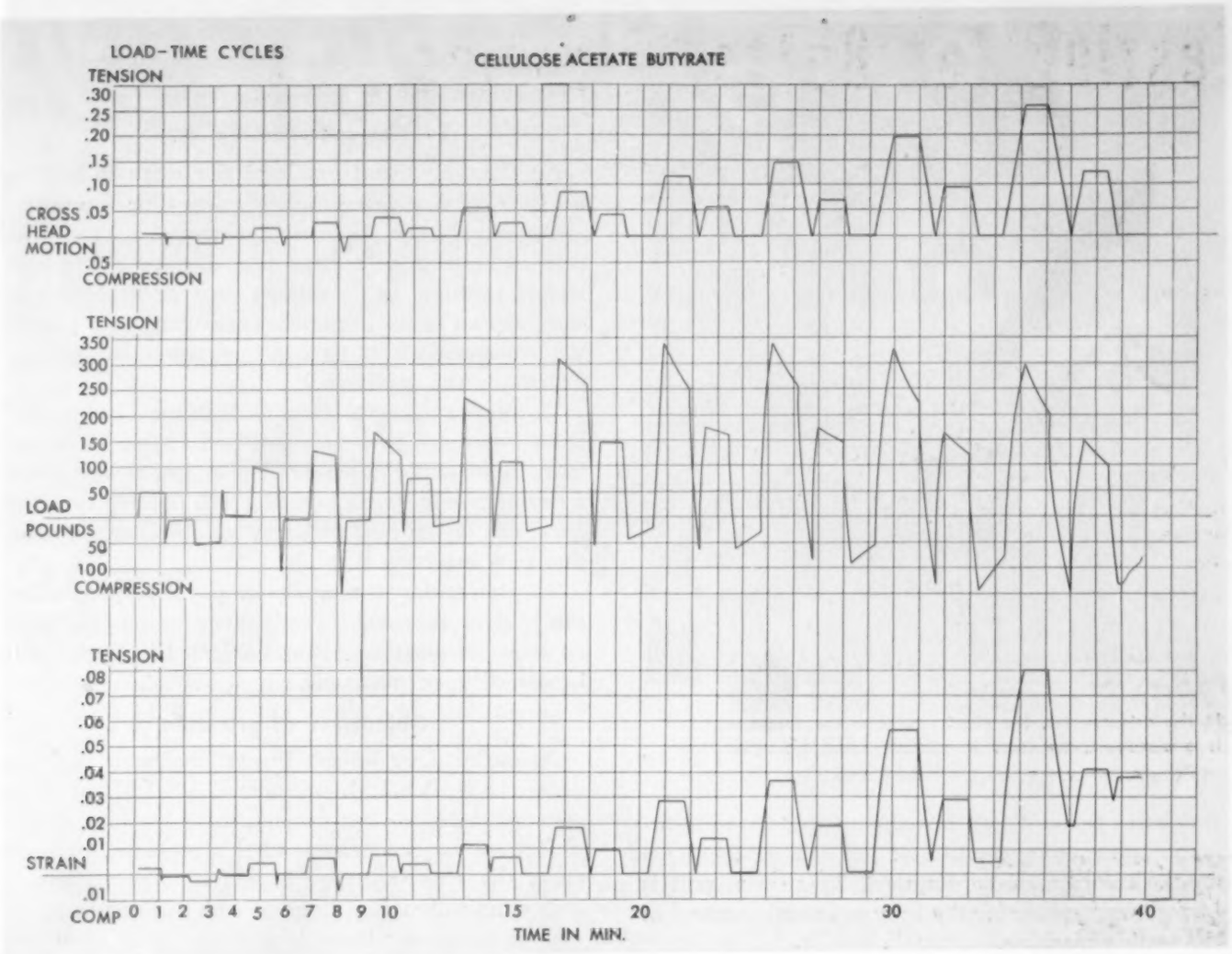
TESTING of plastics materials since their advent many years ago has made use of the same types of equipment and, generally speaking, the same methods as those employed for the testing of metals. This has resulted in a series of tests closely resembling those applied to the metals. For many years technical groups in the plastics industry have felt that the properties thus determined and the methods used to obtain them were not entirely satisfactory for trustworthy design. Furthermore, in many cases the tests did not provide an accurate measure of the way a molded, fabricated, or cast part would stand up in actual usage. Although there have been many technical papers written on the subject of creep or cold flow of plastics materials, it is this property more than any other which has made it so difficult, in fact practically impossible, to develop methods of testing plastics which would permit great accuracy in predicting behavior under conditions of use.

In 1945, through the cooperation of the Plastics Materials Manufacturers Association and the Massachusetts Institute of Technology, a project was set up at M.I.T. for the purpose of conducting research on plastics materials. The American Society for Testing Materials was invited to cooperate in an advisory capacity, and a technical committee composed of P.M.M.A. representatives and its advisers set up the following objectives for this work:

1. The most good can be obtained from a study of mechanical properties of plastics aimed at:
   a) A more fundamental understanding of the physical-mechanical nature of plastic materials,



A general view of the testing machine shows the frame (at left) with movable cross-head, special type of load cell, and special tension-compression grips; servo controls are mounted on a bracket attached to the machine and in the cabinets (seen at right)



The results of cycling tests made on a cross section of cellulose acetate butyrate measuring ¼ by ½ inch. The crosshead of the new machine was moved the distances indicated at top. The corresponding loads and strains on the material are shown below

b) The development of methods of physical analysis which would permit the determination of mechanical properties of a fundamental nature, and

c) The development of ways of using fundamental measurements of this type in the design of plastic structures.

2. The research project should develop methods of testing plastics which will permit more accuracy in predicting behavior under conditions of use.

3. The development of new methods of evaluation should make possible the use of data in designing plastic parts, thus eliminating much of the empiricism now used.

4. The project should not be directed to the collection of data on the properties of plastics.

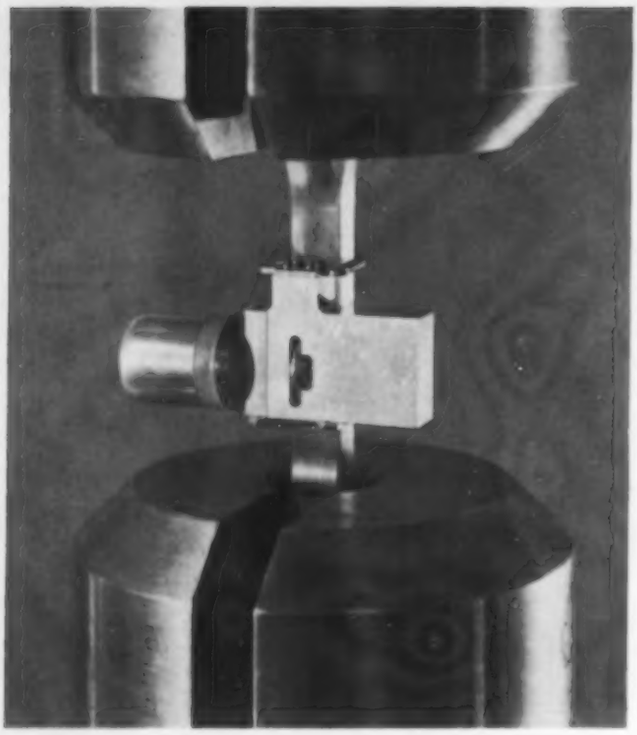
5. The project should not involve the development of new plastics, but should stimulate and guide such developments by plastic materials manufacturers.

6. Guidance of the project by a steering committee representing the industry is essential to the success of the program and it is the aim of this project to supplement rather than duplicate the activities of A.S.T.M. in such matters.

Universal testing machine

It was finally decided to start the project with work on polymethyl methacrylate inasmuch as this material is a reasonably pure linear polymer. To date great strides have been made toward fulfilling all points included in the original scope of this program. A unique universal testing machine has been designed and constructed. Now set up and operating at M.I.T., it has already greatly widened the knowledge of plastics property values. The work is being carried on by a group of 10 persons regularly assigned to this activity, under the direct supervision of A. G. H. Dietz, associate professor, Dept. of Building Engineering and Construction, M.I.T.

An important component of this versatile machine is a "servo" mechanism. The design of servos was greatly advanced during the war for applications to such devices as automatic pilots and gun pointing controls. Essentially a servo mechanism consists of



In this extensometer, the wheel rotates as the specimen is strained and transmits a controlling machine-signal

two basic parts: 1) an instrument to receive information on existing conditions, and 2) a device to act on the information so obtained. This servo unit is largely responsible for the fully automatic control of the testing machine.

Complementing the basic machine is a new type extensometer. In combination with the servo mechanism controlling the machine, the use of this unique instrument permits for the first time the obtaining of property values under conditions of continuously controlled constant rate of strain on materials which deform uniformly.

The only type of strain values obtainable prior to the construction of the extensometer were known as "ordinary strain." This value is defined as the fraction obtained when change of length is divided by original length. With the combination of the new extensometer and the servo mechanism, however, it is now possible to make use of "true strain." A simple definition of this value is the fraction resulting when change of length is divided by original length plus change of length at any instant.

Cross-head motion variable

Many testing machines available today operate on the principle of a constant cross-head motion; that is, a constant rate at which the specimen is stretched or compressed. However, property values obtained under such constant cross-head motion do not take into account change in shape of the specimen during test, and therefore do not give true strain values. With the new machine the cross-head motion is infinitely variable and its speed is a direct function of the cross sectional area of the test specimen which changes constantly under load.

Tension-compression grips

Another important result of the work to date is the development of a completely new type of tension-compression grips for the machine. A special feature of these grips is that once aligned and in the locked position, the specimen may be subjected to compression as well as tension; the grips also permit the load to pass from tension to compression without disturbing the specimen.

There are many additional features of this machine but those already mentioned appear to be the more outstanding to the average engineer who is not a researcher by trade but who will be able to make great use of the new property values obtained with this new machine.

Supplementing the work on physical properties, the project includes investigations of the chemical structure of plastics as it may affect the physical behavior of these materials.

Objectives of program

As outlined by Robert Burns, chairman of Committee D-20, A.S.T.M. and official A.S.T.M. advisory representative for this project, there are four simple objectives for the balance of this program. In some cases the objectives are hopes; in others there is every indication that they will be fulfilled; and for one in particular there is positive proof of attainment. Starting from the practical and going through to the theoretical, these aims are as follows:

1. Through the use of this machine more precise fatigue studies should be practical. Before the development of this machine it was not possible to obtain any property values for fatigue with an adequate degree of accuracy. Under any other known method of fatigue testing used today, it is necessary to obtain stress values by static determinations. While these are satisfactory in many metals where the studies are carried on within the elastic limit, fatigue values in plastics are subject to question because of the creep or cold flow which is always present to an undetermined extent. In order to circumvent the inaccuracies caused by creep, it is necessary to determine values dynamically; that is, while the test is in progress. Through the use of this new machine such studies now become possible.

2. A short-range aim of this project can be classified as applied research. However, it is definitely slanted toward the practical applications of the results obtained. It is the consensus among technical men that many of the properties tested for today are superfluous. It is claimed that although the results may have different names and may be obtained by different methods, they still measure the same prop-

(*Please turn to page* 182)

STAMPS—

Housed in Plastic

Personalized marking set, housed in a two-color case molded of polystyrene, is merchandised by an attractive counter display case with pads for customer demonstration

COLOR PLATES COURTESY RONALD K. DUKE CO.

Plastic mounted stamp is stored in compartment of the set's case; the stamp pad is permanently mounted

STATIONERY, books, personal memos, checks, and private papers may now be made more distinctively personal by means of a plastic marker set recently put on the market by the Ronald K. Duke Co., Los Angeles 32, Calif. This innovation in markers, called My Name, reproduces the user's name and complete address.

The marker and case were designed by E. H. Daniels, Assoc., Pasadena, Calif., in cooperation with Erich Marx, consulting engineer. Styron polystyrene was chosen as the material because of its dimensional stability, resistance to the ingredients used in the special ink in the ink pad, and its low cost and color range.

Molded in two parts

Ease of molding as well as mold making, assembly, and handling by the consumer led to producing the marker in two parts. The mount is produced by the South Gate Tool & Engineering Co., South Gate, Calif., in a 12-cavity injection mold. The bottom plate is made in a 24-cavity injection mold by South Gate. The mount has hollow spaces for economy and to avoid excessively heavy sections.

The case for the marker is injection molded by the Modern Plastics Co., Los Angeles, Calif. The top and bottom are both produced in a six-cavity mold. An ingenious spring action hinge, produced by Cavu, Inc., Monrovia, Calif., keeps the case in a locked or in a conveniently open position. In assembling, the hinge has only to be pressed into corresponding pockets molded into the top and bottom of the case. The ink pad rests on a simple molded frame set tightly into the front part of the case; a single self-tapping screw inserted from below the case holds the pad and frame securely in place. This design necessitated slight undercuts in the front wall of the bottom section which, in turn called for the use of sliding cores.

An attractive counter display unit for the markers has an acrylic lid manufactured by the Hollywood Plastic Art Co., Los Angeles, Calif.

Counter display unit fabricated of acrylic shows three different models of the new plastic marking set. Demonstration pads are provided for use by customers. Several different type faces are available

Abduction shoulder splint of the standard type is cumbersome and hot as it requires sponge rubber or felt padding. The diagonal support makes it impossible to wear conventional clothing

A shoulder splint of acrylic and light weight metal is shaped to conform to upper and lower arm contour, and comes no lower than the patient's hipline. The "L" shaped arm rest needs no diagonal support

ACRYLIC ORTHOPEDIC

A cervical brace of metal and leather is impossible to conceal, complicated, and uncomfortable to both onlooker and wearer

Much less noticeable is the light weight plastic brace which gives the same support and allows X-rays to be taken without its removal

Pressure points of this heavy metal back brace are evident here. The bulges are impossible to hide beneath the clothing and perspiration causes the leather to deteriorate

By making a plaster model of the patient's back, an acrylic brace can be properly fitted in one step. Uncomfortable localized pressure is eliminated and concealment by clothing is a much simpler matter

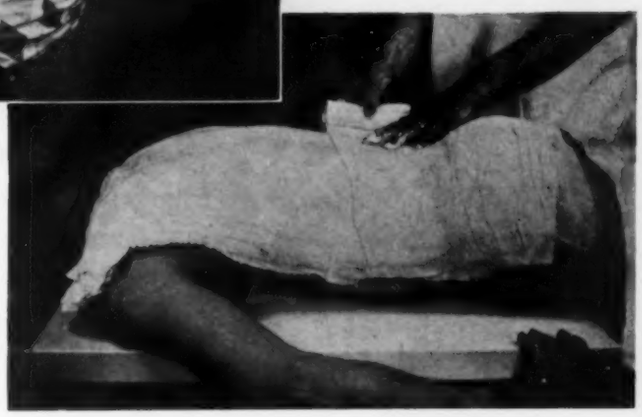
BRACES are easily fabricated, have smooth lines, and are light in weight

FOR several hundred years, the standard brace for spinal injuries and limb fractures has been made, with variations, of leather-padded metal strips bent to fit the body contour. A major change in this field is now being made through the use of transparent acrylic.

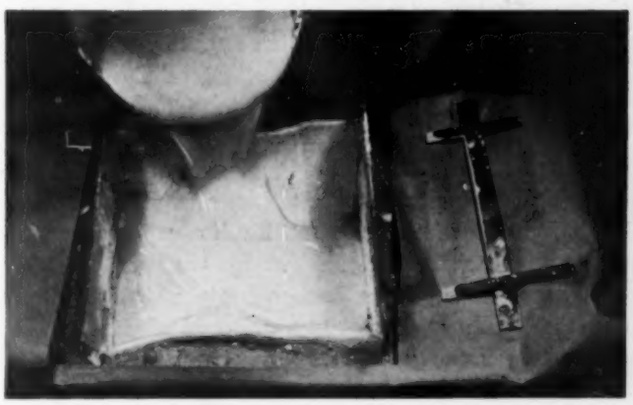
Gratifying results are reported with the new Plexiglas braces developed by Dr. Dana M. Street, chief of the Orthopedics Section, Veterans Administration, Kennedy Hospital, Memphis, Tenn. Their success can be attributed to the method of fabrication and to their advantages over metal braces.

The acrylic sheets from which the braces are made need only to be heated and shaped to a plaster model of the patient's body. Pressure area danger points can be marked on the plaster mold, enabling the doctor to have more direct control over the final result without repeated adjustments on the patient.

A patient finds an acrylic brace much lighter and more comfortable than a metal one. Pressure is not concentrated on the spots where steel ribs or straps bind the flesh, but is distributed evenly over the entire body area covered. The brace is more durable because there is no padding to wear out, is easy to clean, and does not absorb perspiration. Struts or cross pieces are not necessary and the smooth lines of the acrylic brace make it less conspicuous under clothing. Its radiolucency allows a patient to be X-rayed without removal of the brace.



To insure exact fit, the shape of a patient's back is obtained by applying wet plaster bandages. When dry, the rigid layer serves as a mold for making a plaster model



Here the hardened plaster bandage mold is filled with wet plaster. This plaster hardens into a "positive" form of the patient's back and insures an accurately fitted brace

Acrylic sheets are heated until pliable, laid over the plaster model, and shaped to fit exactly. If minor anatomy changes occur, the brace can be heated and re-shaped

These graduation gift mortarboard caps are injection molded of polystyrene. The white hats are for girls, the black ones for men. Hats have re-use value

Graduation hat box for pearls has a padded plastic tray for holding jewelry. Cardboard base acts as support for holder

Mortarboard Caps

That carry the memory far beyond graduation

Three leaders in their fields benefit by joining forces and advertising the same plastic box

UNLIMITED sales appeal, a huge new potential market coming into being each year, and sentimental and re-use value explain why a polystyrene container molded in the shape of a mortarboard cap is meeting with such success as a graduation gift box.

Three companies—Bulova Watch Co. for watches; Coro, Inc., for pearls; and Evans Case Co. for cigarette lighters and compacts—have set a precedent by using the same container and featuring it in their national advertising. Each company has exclusive rights in its field, but by working together the three benefit from each other's advertising and obtain a quality product at a price satisfactory to all.

Credit for the success of this plastic box goes to the supplier, Oxford Products Corp., Boston, Mass., which, armed with a clever idea, merchandised its own product and performed a real packaging service to obtain business for users of the hat. Convinced of the sales appeal but aware that the thousands of dollars to be invested in production required volume usage, the supplier conducted a sales campaign of its own. Prospective users were given the advantages of a cooperative package and were offered exclusive rights in their respective fields.

Polystyrene was selected as the material for the hat because of its low cost and dimensional stability. The two-piece hat is injection molded of black or white Loalin, Lustron, or Styron in a six-cavity mold by Dapol Plastics Inc., Worcester, Mass.; the Morningstar Co., Cambridge, Mass.; and the Oxford Products Corp. It was designed by Gruber & Shea, Boston, Mass. Production was split because of the seasonal character of the package.

In the assembly, the top is drilled to permit attachment of the tassel which is held in place by a small cardboard congratulations card. The hole could not be included in the mold because of weld marks. With the use of a jig, a metal hinge with a saw-toothed edge is next inserted in the base; the top is then attached to the hinge.

No trade identification is put on the boxes, thereby increasing their re-use value as cigarette boxes, trinket boxes, sewing kits, etc. Each company, however, stamps its name on the satin or velvet padding inside. The interiors vary with the needs of the company. Coro includes a padded plastic tray to hold its pearls. A top piece, cut out to hold either a lighter or an oval compact, is employed by Evans. Bulova uses a maroon cardboard base as a support for a padded watch holder above it.

Distribution of the packages also differs with the company. Bulova sells the hats empty to retailers who insert watches from their current stock. Coro and Evans put their merchandise in the boxes and sell them complete.

modern plastics

Published by Modern Plastics, Incorporated

CHANIN BUILDING • 122 EAST 42ND STREET • NEW YORK 17, N.Y.

TELEPHONES: MURRAY HILL 3-0655-56-57

Cable address — Breskinpub

To All Readers of MODERN PLASTICS Magazine

Everywhere

May 15th is the deadline for entries in the Seventh Modern Plastics Competition.

The advantages to be gained by plastics end users, molders, fabricators, material suppliers, tool makers, machinery manufacturers and designers in entering postwar plastics products in this Competition, have been thoroughly explained in previous issues of MODERN PLASTICS and by correspondence. That many of our readers are aware of these advantages is evidenced by the hundreds and hundreds of entries received to date.

World wide publicity will accrue to all who have had a share in the creation and production of award winning items. Through the Exhibit of Entries to be held in New York City in September, every product entered will be studied by visiting industrialists and merchandise buyers. Travelling exhibits of award winners will tour the United States and other countries, promoting more business for those in the plastics industry.

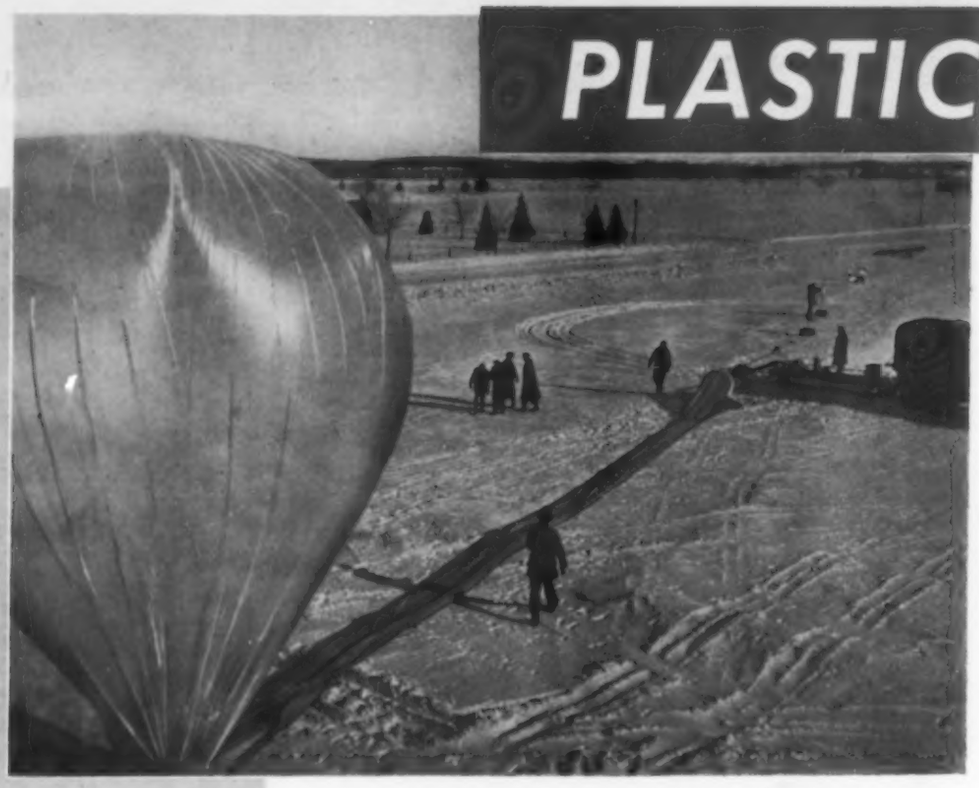
There is no entry fee. You have much to gain by participating in this event. You are assured of wide and valuable notice whether or not you win an award. If you are among the winners or share the credit for an award winning product, you will receive recognition that is invaluable. Indeed, recognition you could get in no other way.

If you have no entry blanks or need more, wire or phone today.

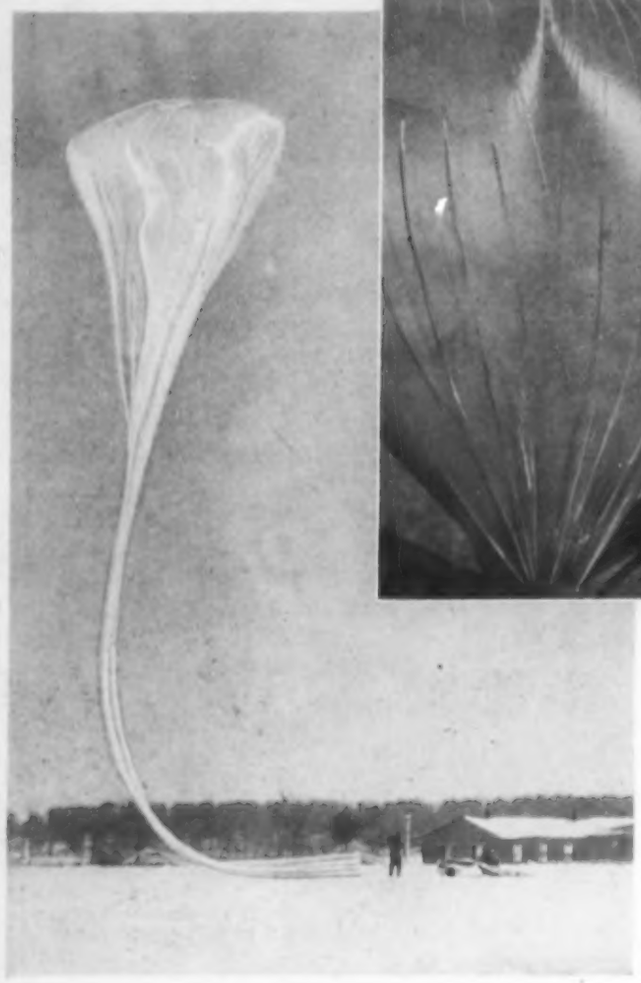
Sincerely,

Charles A. Breskin

Charles A. Breskin
Editor and Publisher



Polyethylene balloon being inflated at Camp Ripley, Minnesota. Balloon has a diameter of 70 ft. when fully inflated



Below—Balloon takes off with small bubble of helium. The gas expands as balloon rises and fills the entire 100-ft. envelope at ceiling altitude

KING-SIZED plastic balloons are among the newest aids enlisted by science to explore the mysteries of the stratosphere. Filled with helium, they rise more than 20 miles above the earth, bearing aloft delicate instruments which automatically record temperatures, pressures, cosmic ray intensities, solar radiation, and other physical phenomena of the high altitudes.

The single-cell aerostat being used in these experiments was developed and constructed by the General Mills Aeronautical Research Laboratories, Minneapolis, Minn., under contract with the Office of Naval Research. The balloon, called the "Skyhook," has been accepted after several months of exhaustive tests, and is being placed in operation at Camp Ripley, near Minneapolis, in an area specially designated by the Civil Aeronautics Administration.

Measuring about 100 ft. long and having a diameter of 70 ft. when fully inflated, the ballons are fabricated of 1-mil Visqueen polyethylene film supplied by The Visking Corp., Chicago, Ill. Although full details of the construction of the balloons cannot be released at this time, some of the problems in fabricating a sheet plastic structure of this size may be appreciated from the accompanying photographs. In the General Mills balloon loft, a traveling dispenser is employed to spread the thin polyethylene film out on the layout table, and sheets are held flat with lead weights until they can be welded and taped to other sections.

Polyethylene best thus far

According to T. R. James, head of the General Mills Aeronautical Research Laboratories, it has not yet been definitely established that polyethylene is the best possible plastic for these balloons. But it has performed better than any other plastic tested that can be obtained in sheets 1/1000 in. thick and 4 ft. wide. Cellophane, for example, becomes too brittle in the cold temperatures of the stratosphere. Rubber hydrochloride film which has greater tensile strength than polyethylene, is weakened by ultra-violet rays at high altitudes. Consequently balloons fabricated from it frequently burst before reaching ceiling height.

In addition to its ability to remain flexible at extremely low temperatures, another quality favoring the use of polyethylene for this application is its light weight. The balloons are so light that they are able to support the required payload of instruments and float in air only 1% of sea-level density. At the time of launching, the Skyhook is filled to only 1.3%

"SKYHOOKS"

Polyethylene balloon 100 ft. long carries delicate instruments 20 miles above the surface of the earth

of its 206,000 cu. ft. capacity. As the balloon ascends, this small bubble of gas expands, completely filling the plastic envelope at its ceiling altitude of about 20 miles. The balloons have ascended at the rate of 1000 to 1400 ft. per min., reaching ceiling altitudes in about 90 minutes.

New methods evolved

Because the Skyhook balloon is based on a new and unorthodox approach, its design, construction, inflation, and methods of launching were developed without benefit of precedent. Manufacturing facilities, suitable for large scale production, and new sealing and assembly methods had to be found. The ground handling, inflation and launching of the huge cells presented previously unknown problems.

The Skyhook does not have a catenary ring, which is standard on conventional balloons. Instead, the load is suspended on a long nylon line from an open ring at the lower end of the balloon. In test flights to date, the Skyhook has carried large parachutes, two radiosondes of different transmitting frequencies, radar reflectors, special temperature and pressure telemetering instruments, and other equipment. Usually, these flights are terminated after 4 hr. by an automatically operated rip cord that tears an opening across the top of the envelope, permitting the instruments to descend safely by parachute.

The Navy Department reports that for additional safety, and to insure recovery of the instruments, the rip mechanism also will be controllable through radio, so that the bag can be ripped at any time. A specially equipped B-17 Flying Fortress will track the balloon with radar, also maintaining contact with the ground control station for the experiments.

Above—Section of layout table in balloon loft. Overhead tracks run full length of 150-ft. table and serve as guides for traveling dispenser which spreads out polyethylene film for assembly

Left—Dispenser spreads 1/1000-in. film on layout table. Sheet is held flat with lead weights until it can be welded and taped to other sections

Red or ivory Tenite soda straw containers can be made at about one-third the cost of the heretofore standard chrome-plated brass dispensers. Molded in two sizes for 8½ and 10½-in. straws by Connecticut Plastic Products Co., Waterbury, Conn. Distributed by Measuring Device Corp., 890 Broadway, New York

A permanent container for paradichlorobenzene vapor giving year-round protection against moths is provided by the Mothmaster, a unit comprising a wire hanger, filler, and ivory, turquoise, or coral Beetle case. Urea-formaldehyde's resistance to this insecticide led to its use. Manufactured by the Irwin-Willert Co., 817 Trendley Ave., East St. Louis, Ill.

A flick of the switch on this home or office two-station intercom system saves time and steps. Trim lines and high impact strength of the housing are obtained by the use of Lumarith cellulose acetate. Molded by Cruver Mfg. Co., 2460 W. Jackson Blvd., Chicago 12, Ill., for Radio Corp. of America, 30 Rockefeller Plaza, New York, N. Y., the black housing has good dielectric strength and a smooth, scratch-resistant surface that discourages dust

PLASTICS

Happy the Humbug and his pals, lovable cartoon characters known to millions of youngsters, are making their debut as plastic brooches. Made by A. D. Bressman Co., Inc., 48-52 W. 38th St., New York 18, N. Y., of Tenite, the line consists of Happy, Hunky the Monkey, the Wondrous Pink Elephant, Hocus Pocus and Jiminy Okus, Pete and Repete, and Boogie Woogie Boogie Man. Ease of molding and ability to take paint led to the use of acetate

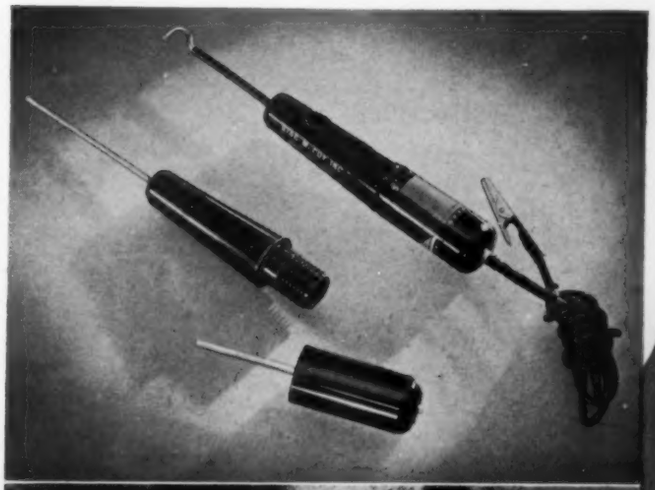
Ardent golfers this year will have no trouble with cleats pulling away from the soles of their golf shoes if they are wearing a pair made by Adams Brothers, Pittsfield, N. H. The reason: Vinylite plastic soles which can stand rough treatment, are flexible, do not absorb moisture, and are mildew resistant. The shoes come in two styles, a saddle oxford and a moccasin type (shown here). They come in solid colors or in two-tones

That lunch box or picnic piece of pie keeps its shape and flavor in Pi-Pak, a handy polystyrene container. These triangular boxes are injection molded in a two-cavity die of red, green, yellow, or ivory Styron by Sun Plastics Co., Cuyahoga Falls, Ohio, for the HurKun Plastic and Metal Products Co., Ravenna, Ohio. They are being distributed to chain, drug, and department stores

Spark plugs may be tested without removal from the engine by using the sparkplug checker manufactured by King McCoy, Inc., Dayton, Ohio. The tubular handle housing is molded of Durez phenolic in two parts by Recto Molded Products, Inc., Cincinnati, Ohio. Graduated readings in the handle indicate the efficiency of the operating plugs. Phenolic was used because of its high dielectric strength, resistance to heat, and light weight

PRODUCTS

It's mass production for baby with this new Melmac and aluminum unit which can heat junior's entire meal in a jiffy. Food is put in the containers which fit into the tray; the tray in turn is set in a water-filled metal base and heated. Nursery Chef is molded by Woodmark Industries, Inc., 4601 Hwy. 7, St. Louis Park, Minneapolis 16, for Howlett Inc., Glenview, Ill. Distributed by A. C. Sanger & Co., Inc., 53 W. Jackson Blvd., Chicago



For the man who owns a car and washes it himself, this Hand-ee-Sponge will prove a great timesaver. When attached to the conventional garden hose, it quickly scrubs away grit and dirt without the danger of marring the surface. The Bakelite holder prevents water from being squeezed out of the sponge when gripped. Produced by Abar Plastics Co., 6940 Formosa Way, Pittsburgh 6, Pa., this sponge can perform other household tasks as well

Three cushiony rings of this pint-sized sea safeguard toddlers against bumps and scratches. Bright blue fish and sea horses painted on the bottom add a salty touch. Bilnor Corp., 71 Baruch Place, New York 2, N. Y., fabricates this wading pool of clear Vinylite plastic, electronically welding the seams. When not in use, it folds into a small bundle. Its three automobile type valves allow quick inflation by lung or bicycle pump powe-

A janitor with as much as 3200 sq. ft. of floor to be waxed can do it quickly with this waxer whose handle-tank of Tenite II cellulose acetate butyrate holds a gallon of liquid wax. The width of each sweep is 18 inches. Marketed by American Specialty Co., 1000 Franklin Ave., Amherst, Ohio. Carter Products Corp., 6923 Carnegie Ave., Cleveland, extrudes the handle; Plastic Engineering, Inc., W. 85th & Lake Ave., Cleveland, molds the caps

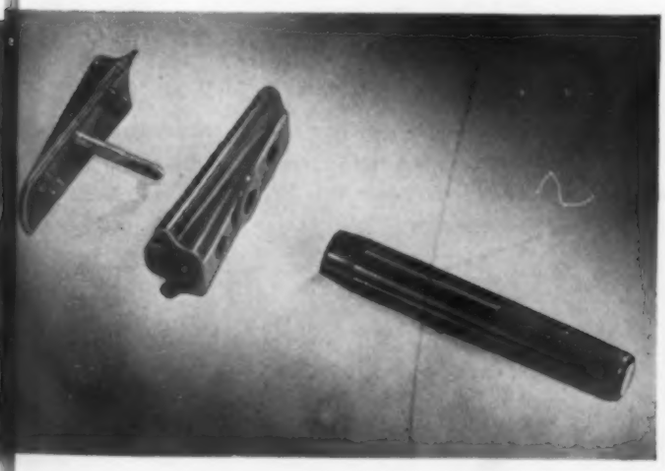
PLASTICS

Anyone who has set a container on one end of a shelf — with just a slight push — only to see a glass bottle at the opposite end crash to the floor will find that the curved edges of this new acrylic utility shelf form a handy stop. The corners are not curved; a quick wipe with a damp cloth cleans out dust and keeps the shelf spotless. S-L Plastic Products, Box 197, Tenafly, N. J., fabricates it from Lucite or Plexiglas sheet. The two shelf brackets are assembled with a solvent cement

A distinct departure in the design and material of the Ingersoll alarm clock housing was sought by U. S. Time Corp., 630 Fifth Ave., New York, N. Y., when the firm decided to restyle the clock. Celcon ethyl cellulose was the choice for the housing because of its ease of manufacture and assembly, good appearance, durability, and wide color range. This new Ingersoll, the Ami, is a 40-hr. alarm clock and comes in emerald, navy, wine, or ivory

Milady's spring wardrobe is enhanced by these earrings and necklace ranging from palest amber to deepest tortoise. Fabricated from Bakelite cast resin rods by Mastercraft Plastics Co., Inc., 95-01 150th St., Jamaica, N. Y., for Castlecliff Inc., 366 Fifth Ave., New York

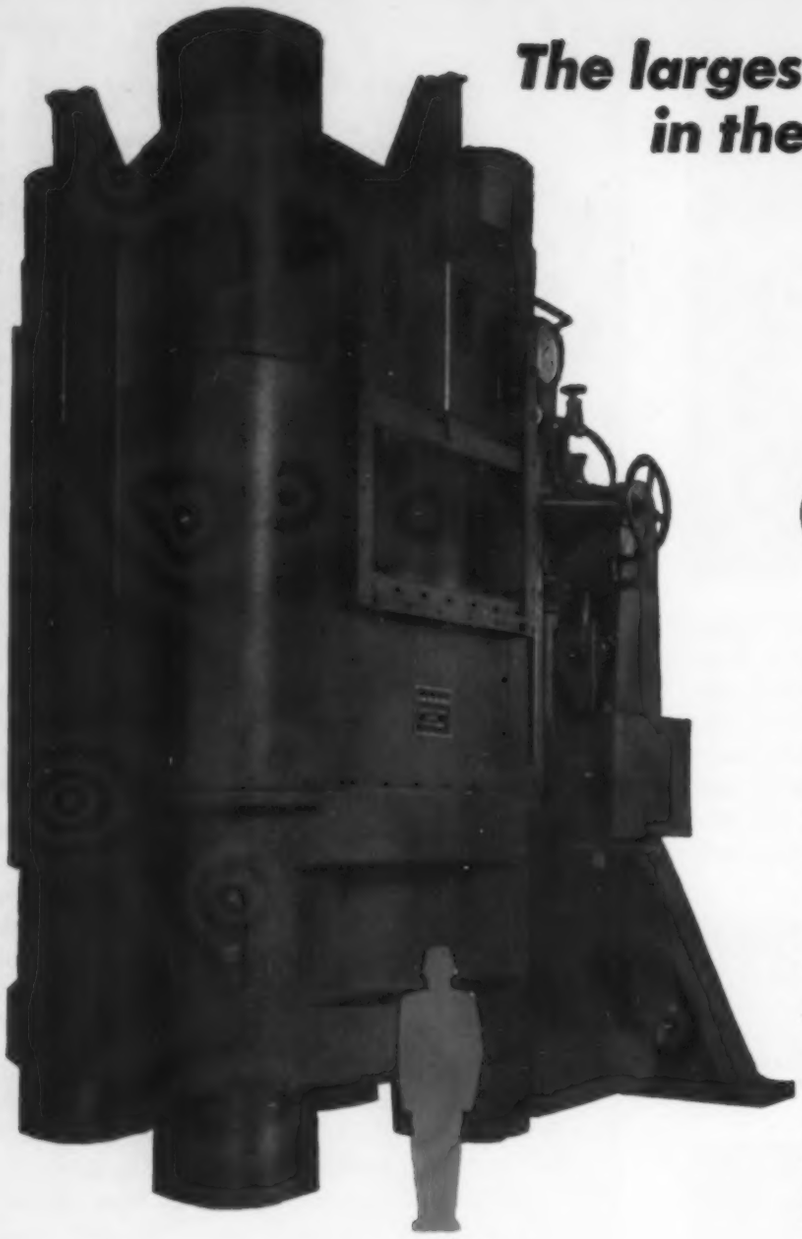
PRODUCTS



Increased safety is claimed for this new razor because of the slant cut permitted by the special construction of the head, and the undercut curves which allow a complete shave without clogging of the entire razor blade. This razor, which is manufactured by E. B. Kingman Co., Leominster, Mass., is being offered as a proprietary item. It is injection molded of Lustron or Styron in a six-cavity die. Crazing around inserts has been overcome by mold design and careful selection of knurling

Two packs of cigarettes can be loaded at one time into this automatic cigarette server being distributed by Best Plastics Sales Co., 120 Cedar St., New York, N. Y. All-Plastics Corp., Avon-by-the-Sea, N. J., molds the side walls of cellulose acetate, and the top cover and cigarette platform of polystyrene. This platform is ribbed on the bottom for increased strength. The server is available in transparent, opaque, or colored material

The largest hobbing press in the plastics industry



Hobbed Cavities *by* Midland . . .

An important addition to Midland's expanding facilities is this 8000 ton hobbing press, the largest of its kind in the plastics industry.

This mammoth press with a ram diameter of 39½ inches makes it possible for Midland to hob cavities of approximately 80 square inches . . . almost tripling former hobbing limits.

With this press, Midland is prepared to supply plastic molders with hobbed cavities for large plastic parts including radio cabinets, large container escutcheons and instrument housings. Multiple cavities can be hobbed . . . "like peas in a pod" . . . quickly, with complete uniformity and accuracy. Multiple cavities will speed up your production with a minimum of expense.

Midland experience and facilities, in addition to skilled craftsmen, are ready to serve you . . . to produce the finest and deliver on time when you specify "Hobbed Cavities by Midland."

Write for your copy of "How to Heat Treat Hobbed Cavities," a practical heat treating treatise to help you get the best performance from Hobbed Cavities by Midland.

Cavities for: **Radio Cabinets** **Escutcheons** **Instrument Housings**

D&E

MIDLAND DIE AND ENGRAVING COMPANY

1800 W. BERENICE AVENUE • • • CHICAGO, ILLINOIS

Makers of Plastic Molds ★ Die Cast Molds ★ Engraved Dies ★ Steel Stampings ★ Hobbings ★ Pantograph Engraving

PLASTICS ENGINEERING*

New Developments in Steam Preheating†

by S. K. MOXNESS AND JEROME FORMO‡

THE importance and desirability of automatic molding presses for the plastics industry have long been evident. The success of such equipment for thermoplastic materials has stimulated the attempts to develop similar automatic equipment for thermosetting materials such as the phenolics.

When a large expansion program was begun in the Plastics Div. of Minneapolis-Honeywell Regulator Co. a few years ago, the possibilities of using such equipment were seriously considered. It was decided at that time to design all new presses so that they could be easily converted to automatic operation. It was decided also to use transfer molding as far as possible in order to reduce mold maintenance costs and to increase the production per press. One of the major problems of automatic transfer molding is that of preheating the material rapidly enough for short transfer times. Dry oven preheating was found to be too critical when the material was heated to the desired temperature. At that time high frequency preheaters appeared to be too expensive to operate with hopper fed presses. Some work had been done with steam preheating which seemed quite simple to use and showed very promising results. Thus it was decided to build the new presses to allow for the addition of steam preheater units at some future time. In the meantime, steam preheaters of various designs were built for production jobs in order to more thoroughly test them out and to develop the most suitable design of preheater. Several preliminary units have been built and tested. The present design, (Fig. 1), is being used with a large battery of transfer presses with good success.

Although these units have been built as auxiliary preheaters, some press mounted designs have been ready for the tool room only to be halted by further developments. One major problem has been the control of the amount of moisture put into the heating atmosphere. An early oven used a series of water sprays which injected a water mist into the air stream of a circulating air oven. The orifice in each spray head soon was clogged with the minerals precipitated from the water and had to be cleaned out periodically. This method was then replaced by a simple type of flowmeter for steam.

This flowmeter consisted of an orifice and pressure gage. By calibrating the orifice at several pressures it is possible to determine the quantity of steam passing through it simply by noting the pressure on the gage. This method was quite satisfactory until stray impurities such as scale and possibly corrosion products changed the size of the orifice and threw the system out of calibration. Strainers were put in the steam line but without sufficient improvement to make the system entirely satisfactory. Flowmeters of the rotometer type have been tested and found very useful. However, the delicate nature of many of these instruments as well as their relatively high cost makes them somewhat unsuitable for shop use.

At present a simple furnace type dripper

Since the appearance of an article[1] on steam preheating in the February 1947 issue of MODERN PLASTICS magazine, further tests have been made to determine the actual effect of moisture on electrical characteristics of molded plastic pieces. At that time, it was indicated that "charges preheated by this system produce transfer molding results which are approximately equal to those produced by high-frequency dielectric preheating in every respect but electrical characteristics."

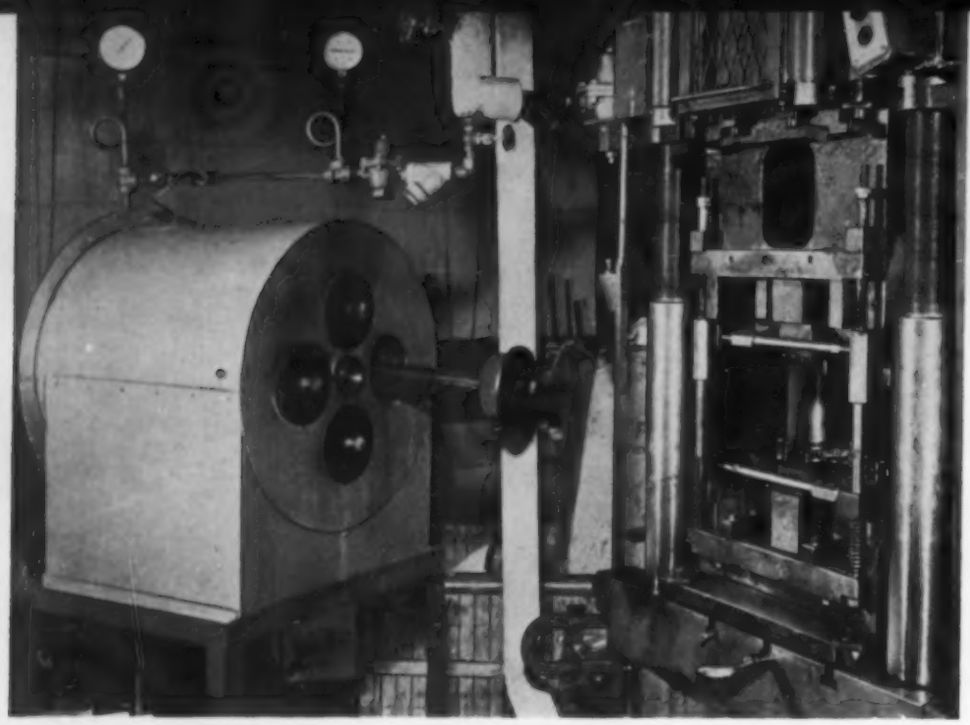
Current interest in the steam preheating process prompted the present article which is intended to be of help to the molder using this method. At least three manufacturers are known to be planning or producing preheaters using the steam process.

*Reg. U. S. Patent Office.

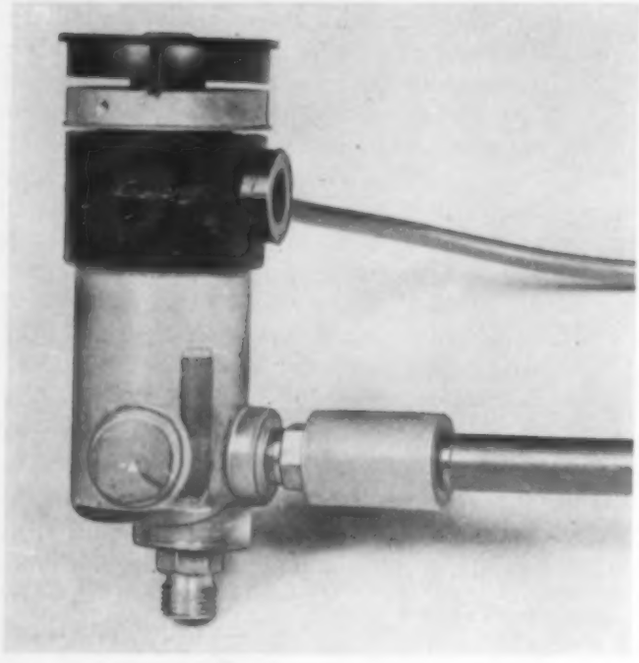
†A similar paper was presented before the 1948 annual technical meeting of the Society of Plastics Engineers, held at the Rackham Memorial in Detroit.

‡Respectively, chief process engineer and supervisor, Plastic Div., Minneapolis-Honeywell Regulator Co., Minneapolis 8, Minn.

[1] "Preheating plastics with live steam," by S. K. Moxness and Jerome Formo, MODERN PLASTICS 24, 141-147 (Feb. 1947).



1—The typical steam preheater shown here at a press is heated by a steam coil surrounding the inner lining of the oven. Moisture is added by a tube leading in through the rear of the oven from where it drips onto the oven floor and is converted to steam



2—Mounted outside an oven such as pictured in Fig. 1 is this water dripper which is used to regulate the quantity of water added to the oven. The dripping rate can be closely controlled by turning the knob on top of the unit

humidifier (Fig. 2) is being used to introduce moisture in the form of water dripping onto the floor of the preheater where it is instantly converted to steam. By this means control of the moisture in the oven atmosphere can now be maintained closely enough so that automatic loading and preheating equipment can be built. Work has been done on an electronic relative humidity control which may lead to the development of a suitable control for the range of temperatures encountered in steam preheating ovens.

Special tests have been run to determine the effect of delaying the loading of preheated preforms up to one minute after removing them from the steam preheater. Fully satisfactory transfer molding of most parts was possible even with the delay. Thus it can be seen that any reasonable delay in the operating cycle will not throw the preheat so far out of cycle that material must be discarded. In fact, these tests led to the development of the preloader which is simply a secondary transfer pot in which the preheated preforms can be stacked before the mold is opened to eject the previous charge. Thus when the mold is closed the transfer ram can be immediately lowered without waiting to load the pot. This method saves up to 5 sec. per cycle which may amount to 1½ hr. per day on short cycled jobs.

With suitable moisture control and with the possibility of delaying loading of preforms if necessary due to slight delays in the molding cycle the main problems in automatic preheating as used in automatic transfer molding have become insignificant.

It is well known that heating a thermosetting material first brings about a softening reaction. It has been demonstrated that heating in the presence of moisture softens the material more rapidly and also to a greater degree. The rate of softening can be measured by means of a penetrometer such as is used in asphalt testing. In these tests a 200-gram load is applied to a Roberts #2 sharp needle for 0.25 min. and the depth of penetration is measured. This load is applied 0.15 min. after removing the preform from the preheater so that the entire measurement is completed within less than ½ minute. From such tests it has been found that maximum softness is achieved in a dry oven in about 30 min. while with an average amount of moisture added the same degree of softness is achieved in 10 minutes. Moreover, with this amount of moisture the preforms can be made about 30% softer before molding.

The ability of steam preheat to soften phenolic materials at an increased rate of speed makes possible the use of lower transfer pressures than when using dry oven preheat. To accomplish the same results as with high frequency units it sometimes is necessary to use 15 to 20% additional transfer pressure. However, if 0.001 to 0.002 in. per in. additional shrinkage can be tolerated equal transfer pressures can be used.

In Fig. 3 it is shown that at a given temperature the steam preheated preform is softer than those preheated by other means. This is of particular advantage when the mold design or part design makes long runners necessary for it indicates that steam preheated material may flow through such long runners without precuring. This is true also for complex parts in which the material must flow around many inserts or corners before filling out the cavity.

The change in weight of a preform during preheating is interesting to observe. This change can be seen by mounting a balance above a preheater with a long wire projecting down into the oven and supporting a preform at its end. The results indicate that the cold preform condenses considerable water on its surface just after being placed in the preheater. However, in a short while the heat lost by the condensed vapor soon warms the preform to the point where it begins to drive off as much and then more moisture than it condenses so that the net gain in water during preheating is usually very little, if any. This control of moisture content is a very important advantage of steam preheating in that it makes possible the tailoring of a material to suit a specific job. Thus when one characteristic such as tensile strength is particularly needed, it is possible to adjust the preheating to obtain the moisture content which gives the maximum value for that characteristic. It is not often possible to reach the maximum in all characteristics at one time, but a suitable combination of values may usually be attained.[2]

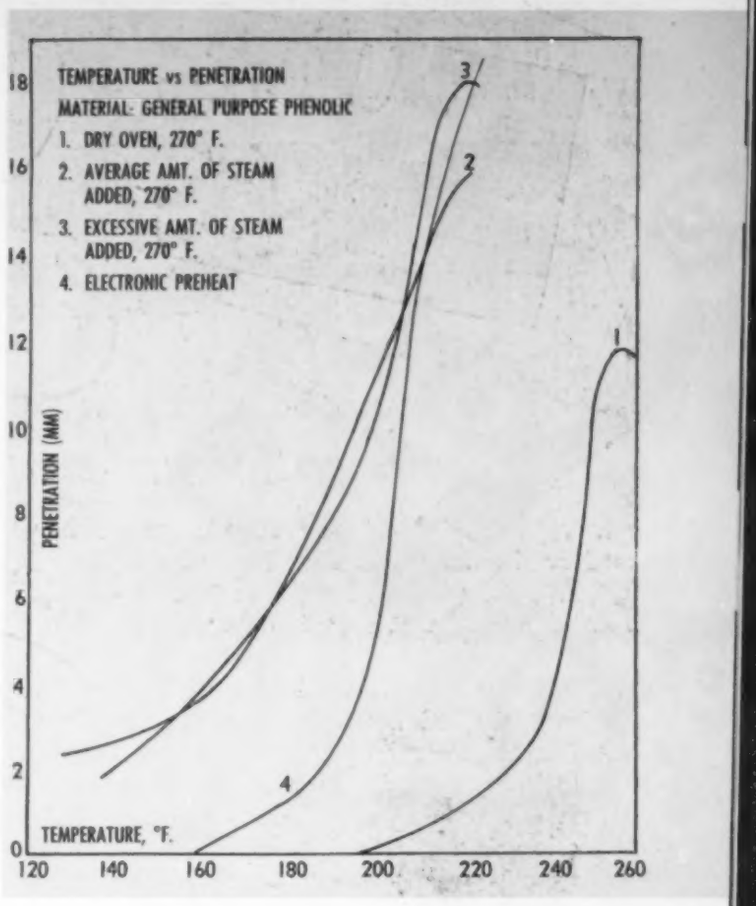
The mold shrinkage of a particular part is a result of several factors. Among these, mold temperature plays a large part for a great amount of the shrinkage is merely thermal contraction. However, the amount of such contraction can be effectively varied over a fairly large range by controlling such factors as runner and gate design, transfer speed, transfer pressure, degree of preheat, and the amount of moisture or volatile matter in the powder.

Moisture varies shrinkage

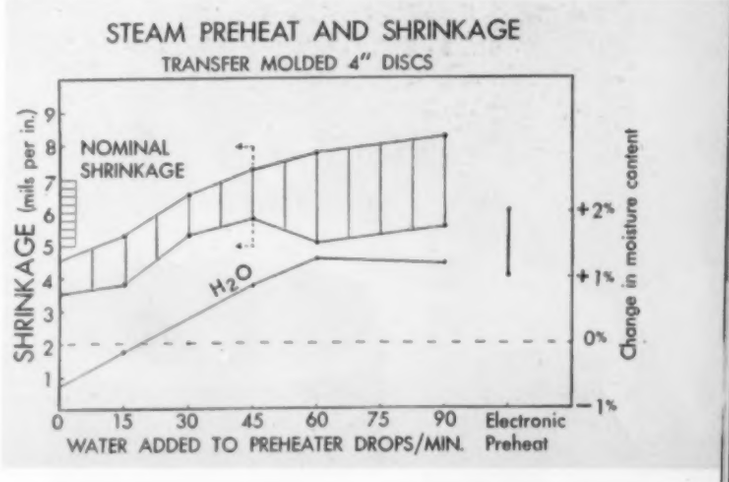
As shown in Fig. 4 it is possible to vary shrinkage appreciably by varying the amount of moisture in the oven. It has been reported previously[1, 3] that shrinkage is directly proportional to moisture content. In several cases this has been of definite help in compensating for off-size molds or for variations

(*Please turn to page 112*)

[2] *The Durez Molder*, Nov. 1947, p. 2, 3; Dec. 1947, p. 6, 7; Jan. 1948, p. 4.
[3] "Plasticity of molding compounds," by Robert Burns, MODERN PLASTICS *18*, 72-74, 104 (May 1941).



3—The softness of preforms at various internal temperatures following preheating under varying conditions is compared. The steam preheated preforms shown in curves 2 and 3 softened at lower temperatures than the others



4—The relationship between shrinkage range and moisture content of molding material is illustrated graphically. The range of shrinkage is a result of the difference in shrinkage across the flow and with the flow of the transfer molded material. A close relationship between shrinkage and electrical properties of general purpose materials is evident. When the shrinkage appears normal the electrical properties should also be satisfactory

Why
a Plaskon Molding Compound
is used for these striking
Cosmetic Containers

o radiantly beautiful . . .

so stimulating to sales . . .

because they're

Plaskon Molded Color

In the highly competitive field of cosmetics, *eye appeal* of containers is a powerful sales factor.

These handsome Colt's containers, made from Plaskon Molded Color, are excellent examples of those producing sales for many world-leading cosmetic manufacturers.

Brilliant, flaming colors . . . delicate, subtle hues . . . Plaskon molding compounds are available in a striking chromatic scale ranging from translucent natural and pure white through pastels to glowing jet black.

Highly important in the use of Plaskon Molded Color for cosmetic containers is the fact that this material is completely resist to common commercial solvents, and is impervious to the effects of oils, greases and waxes. Molded Plaskon is non-porous, and resistant to dilute acids and alkalies. This plastic material cannot in any way affect the delicate or distinctive aromas of creams, powders, perfumes or other cosmetics.

Plaskon Molded Color is warm to the touch and attractive in appearance, which encourages handling and use of the packaged product.

Thermosetting Plaskon urea- and melamine-formaldehyde molding compounds have a wide range of advantages, that induce greater efficiency in manufacturing and merchandising methods. Our experienced field m are available to help you adapt *thermosetting* Plaskon Molding Compounds to your needs. Write for free book on Plaskon* Molded Col

*Reg. U. S. Pat. O

PLASKON DIVISION

LIBB
2121

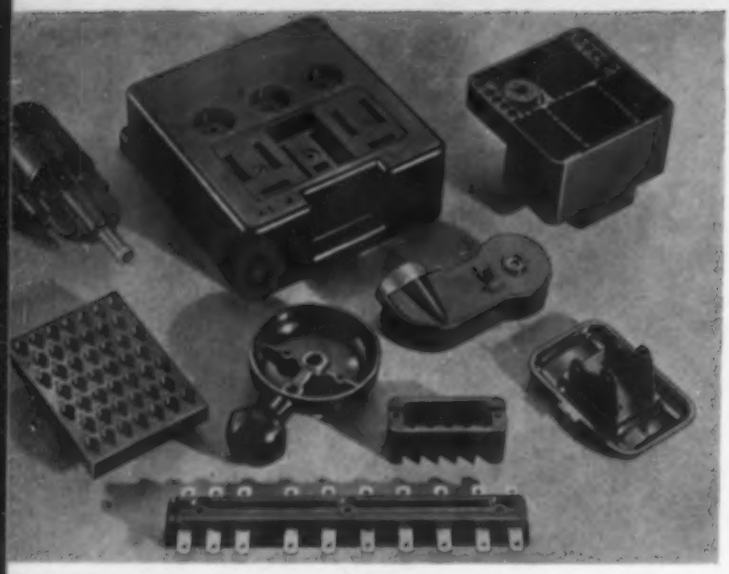
These Plaskon Molded Color cosmetic containers are produced by Colt's Manufacturing Company, Hartford, Conn.

LIBBEY • OWENS • FORD GLASS COMPANY
2121 Sylvan Avenue • Toledo 6, Ohio
In Canada: Canadian Industries, Ltd., Montreal, P. Q.

PLASKON

TRADE MARK REGISTERED

MOLDED COLOR



5—The complex parts above as well more simple parts in which dimensions are of less importance have been produced from preforms softened by preheating with steam

in the shrinkage of materials from batch to batch. The difficulties involved in attempting to correlate artificial aging with actual service conditions are fully realized, and for that reason many different tests have been used to check on the performance possibilities of a part. For the purpose of determining after-shrinkage, molded parts are subjected to an oven temperature of 200° F. for prolonged periods. Parts molded from preforms preheated by steam and electronic methods were baked and the shrinkages over a period of 120 days were found to be identical.

As surface appearance is often a criterion of the method of preheat, a test was run, using a profilometer, to determine the surface roughness of parts molded in a highly polished mold. In the normal range of 0 to 30 drops of water per min. a surface finish of 5 to 7 microinches is identical with the surface achieved with electronic preheat. Actually, it is virtually impossible to detect any difference in surfaces with the unaided eye. However, the use of excessive moisture will result in a somewhat roughened appearance. For these tests a load of 50 grams was heated in an oven of 1¼-cu. ft. capacity. Loads of up to one pound can be heated for 1½-min. press cycles in this oven, but more moisture is needed for the same results.

Except in extremely severe electrical conditions, the use of steam preheating is entirely suitable for molding electrical parts (Fig. 5). However, as can be expected, the dielectric strength and insulation resistance of phenolics drop off with an increase in the moisture content. Tables I and II give the values as determined by standard A.S.T.M. tests. It may be seen in Table I that even with 30 drops of water per min. in the preheater, the dielectric strength of the molded part exceeds 300 volts per mil.

Table I.—Dielectric Strength of Steam Preheated General Purpose Phenolics

Test sample No.	*Amount of water added during preheating*[a]	*Dielectric strength*
	drops/min.	*volts/mil*
2	Dry preheat	304.2
4	Dry preheat	304.0
12	Dry preheat	250.5
13	15	320.4
18	15	298.0
20	30	311.0
22	30	312.0
25	30	313.0
26	45	280.0
31	45	280.0
61	45	250.0
62	45	300.0
34	60	260.0
37	60	272.0
71	60	284.0
72	60	242.0
73	60	310.0
41	90	218.0
42	90	200.4
45	90	218.0

[a]Even with 30 drops of water per min. it can be seen from this table that the dielectric strength of phenolic molded discs is not reduced below the nominal 300 volts per mil which is considered standard for general purpose powder.

Aside from its adaptability to automatic molding, another advantage of steam preheating is the economy of operation. Typical figures are 0.03¢ per lb. of material or 1.5¢ per hr. with little or no maintenance. The initial cost is also very low when compared with other methods giving comparable preheating results.

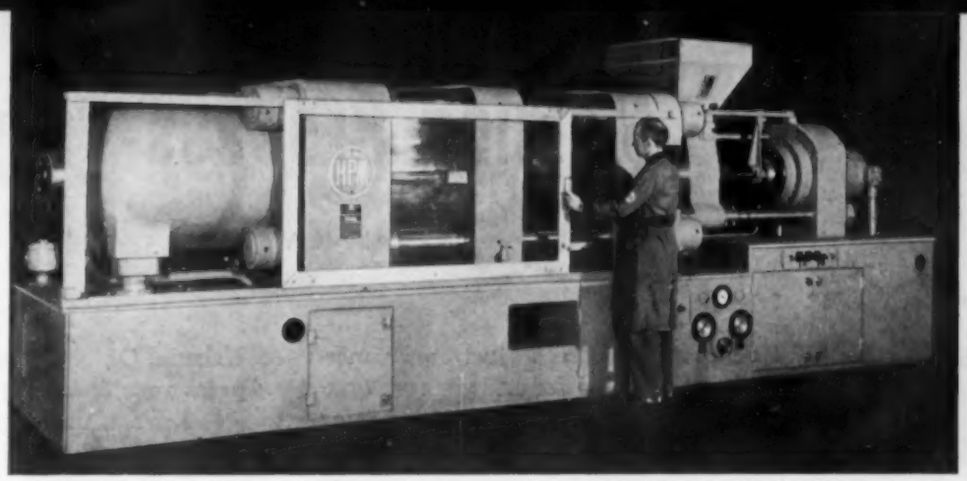
It is encouraging to note that continuing work with steam preheating brings out further evidences of its suitability as a production process in the vast majority of phenolic molding applications. C. G. Phillips' work[4] in Great Britain indicates that his work confirms the previous report on steam preheating.[1]

[4]Phillips, C. G., British Plastics *19*, 219, 330-332 (August 1947).

Table II.—Insulation Resistance of Parts[a] Molded with Steam and Electronic Preheating

Preheat	*Megohms*		
	Low value	*High value*	*Average*
Drops of water/min.			
0	92,000	275,000	181,250
15	69,000	275,000	128,660
30	61,000	65,000	62,000
45	21,000	36,500	28,470
60	8,100	26,900	18,100
90	6,900	11,700	8,825
Electronic	79,000	183,000	111,000

[a]The insulation resistance of general purpose phenolic moldings is influenced appreciably by the amount of moisture used during preheating.



Entirely automatic machine can mold 40 oz. of acetate or 32 oz. of polystyrene in one shot. Chamber for plasticizing material is over 3 ft. long. Machine weighs 82,000 lb.

Forty-Ounce Injection Machine

RECENT development of a large capacity thermoplastic injection molding machine, capable of molding 40 oz. of acetate or 32 oz. of polystyrene per cycle, opens up many new possibilities for the plastics molder. This giant machine, one of the largest single-nozzle injection machines ever built, was designed by The Hydraulic Press Mfg. Co., Mount Gilead, Ohio, specifically to broaden the scope of plastics mass production to include such items as refrigerator parts, toilet seats, large radio cabinets, and similar large area parts. Entirely automatic in operation, the machine molds all types of thermoplastic material although vinylidene chloride requires a special alloy heating chamber.

Hydraulic mold clamp

The mold clamp on this machine is an advanced development for the successful production of commercially sound plastics. It consists of a large hydraulic double-acting ram fitted with a small internal booster ram for the fast closing of the mold. Die slam is eliminated through automatic slow-down which takes place just prior to mold contact. The mold opens slowly until the molded part releases itself from the stationary mold half; mold travel is then rapid. Speed is again retarded prior to ejection of molded parts to protect them from damage. These slow-downs can be used at the option of the operator. The return stroke of the mold clamp is readily adjustable to permit the shortest possible die travel for each specific part molded. This results in the fastest possible production cycle.

The hydraulic mold clamp enables the plastic molder to quickly and easily change molds. No adjustments are required to compensate for different mold thicknesses. Convenient handwheel controls provide for independent adjustment of injection pressure and mold clamp pressure. The speed of both injection plunger and mold clamp is also independently adjustable.

This new 40-oz. injection machine weighs 82,000 lb.; it is 264 in. long, 60 in. wide, and the heating chamber for plasticizing the molding material is over 3 ft. long. Two H-P-M Hydro-Power variable displacement radial piston type hydraulic pumps generate the operating pressure. Oil is used as the hydraulic pressure medium.

Other specifications for this injection molding machine include:

Mold clamp (tons)	750
Maximum pressure for separating molds (tons)	60
Maximum mold space (horizontal x vertical)	51 by 25 in. or 30 by 47¾ in.
Daylight opening (max.)	42 in.
Mold clamp speeds (in./min.):	
Closing	475
Opening	290
Injection pressure on material (max.)	20,000 p.s.i.
Injection plunger speeds (in./min.):	
Fast advance	180
Injection (constant)	75
Return	125
Rate of injection (cu. in. per min.)	1330

Polystyrene toilet seat weighing 28 oz. is an example of type of piece which can be molded on new injection press

Unique Molding Process Proved in Use

by K. W. HALL*

A PLASTIC molding process just announced differs from popular "transfer and plunger type" molding techniques in that two stages of injection are used instead of one. Each stage serves a definite and useful purpose in the presses utilizing the new Tri-dyne[1] process which have been built by Definance Machine Works. These presses have already provided a 14-month background of production experience at Plastics Research Products Co., Urbana, Ohio. The use of two stages in one molding press results in three desirable operating features:

1. Fast, uniform heating
2. Thorough mixing
3. Accurate moisture control

Fast, uniform heating of the mold charge in the new process is secured in the press by rapid conversion of pressure energy to heat energy. Thorough mixing is obtained by extruding a thin ribbon of material in a random manner into a chamber having a greater volume than the mold charge. Moisture rapidly evaporates from this thin ribbon of material and is permitted to leave the system in variable amounts determined by the adjustment of the press cycle controller.

The accompanying drawing illustrates the Tri-dyne process. With the press open, the operator places a moderately preheated (140 to 240° F.) charge of material, either granular or preformed, into the loading pot. The mold is then closed by the main ram and subsequently the "thermo-injector" is advanced by low pressure. Application of high pressure to the main ram clamps the mold halves securely together. Simultaneous operation of the "thermo-injector" then forces the material charge in 3 sec. or less through the annular orifice into the transfer pot. During this operation a high (20,000 to 40,000 p.s.i.) and substantially constant pressure drop across the restriction is maintained.

Transfer pressure of 1500 to 7500 p.s.i.

With the press closed, the orifice formed by the top inside edge of the loading pot and the lower outside edge of the fixed core will have a thickness in the range of between 0.005 and 0.065 in., depending upon the physical characteristics of the material being handled. After a dwell of 0 to 10 sec., which permits the desired amount of moisture vapor to leave the system, the transfer ram moves down to push the material through the runners and gates into the die cavities. The unit transfer pressure of 1500 to 7500 p.s.i., which is substantially less than that used for "thermo-injection," determines the projected die area that may be used with a given die clamping force. After a short cure interval the press opens and the molded parts are removed, the mold scavenged, and the operator is ready to start the next cycle.

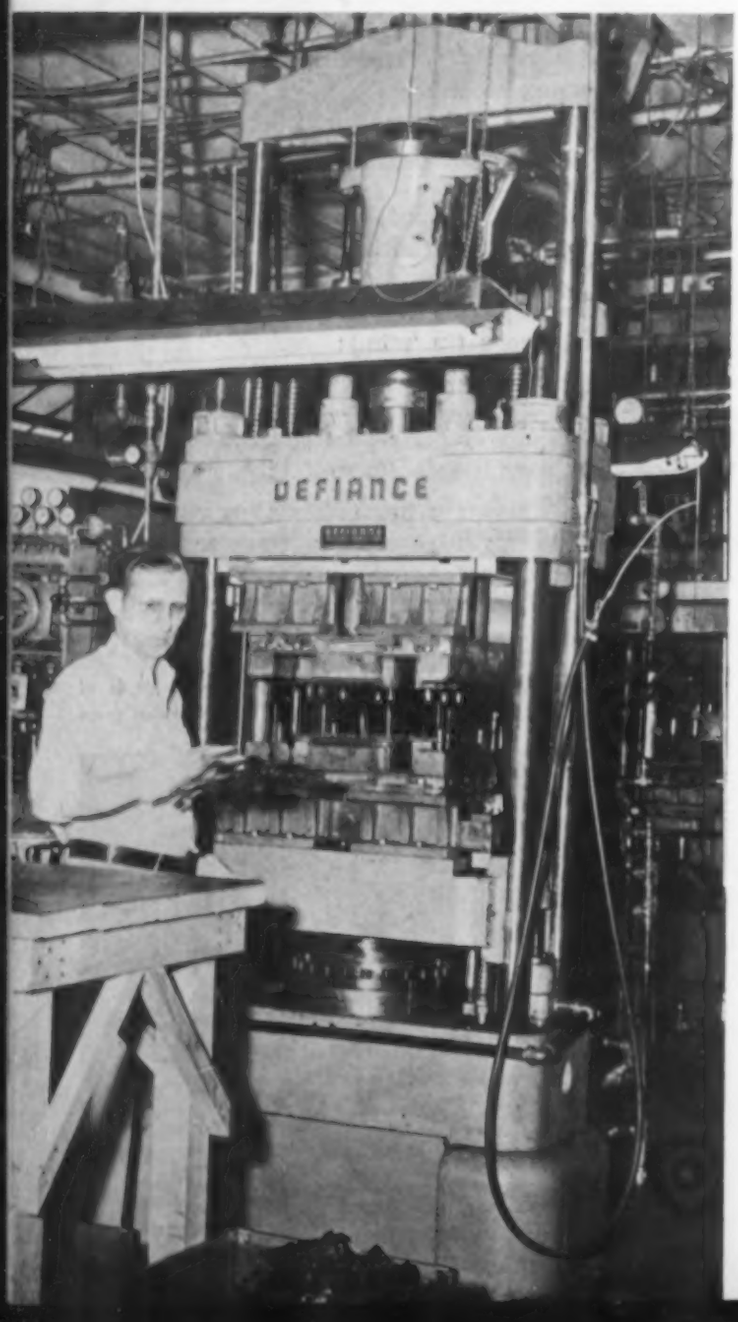
Automatic cycling equipment is required for carrying out this process because accurate time control is essential.

(*Please turn to page* 117)

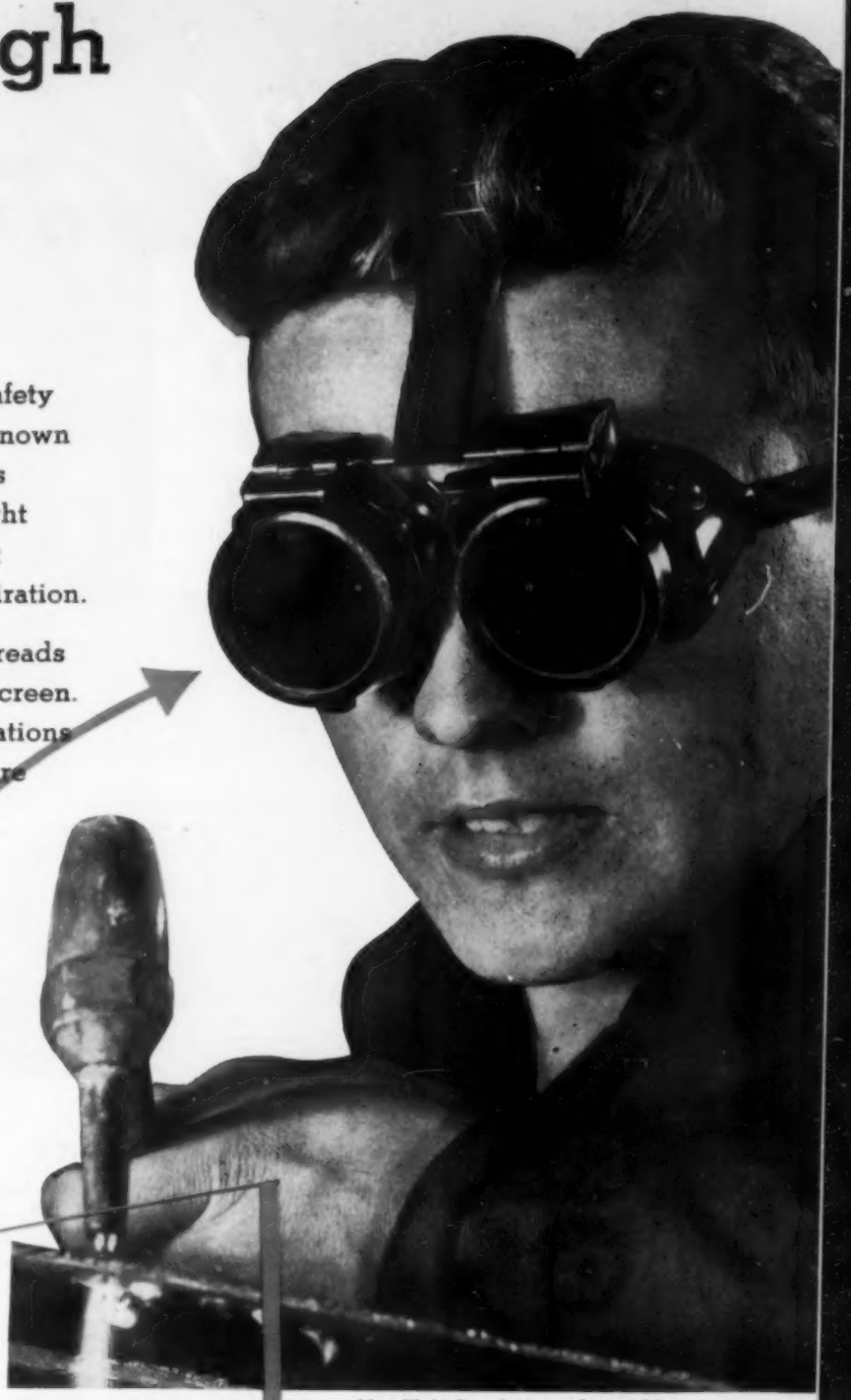
*Research and development engineer, Definance Machine Works, Inc., Definance, Ohio.

[1]Patents pending.

Press using two stages of injection to achieve operating advantages described in the accompanying article



Tough Enough for Safety



Double Tenite frames insure maximum safety and comfort for the wearer of these well-known chipping and welding goggles. Tenite has excellent impact strength, is light in weight and pleasant to the touch. It is low in heat conductivity, and is not harmed by perspiration.

Protective glasses are held by Tenite threads which are injection molded around wire screen. Frame production is rapid, finishing operations are simple and few. Since these goggles are manufactured by the millions, the economical volume production made possible by Tenite is a decided asset.

For further information about the properties and many uses of Tenite, write for a free 32-page color-illustrated book, to TENNESSEE EASTMAN CORPORATION (Subsidiary of Eastman Kodak Company) KINGSPORT, TENNESSEE.

Chip-Weld Goggles manufactured by Willson Products, Inc., Reading, Pa.

TENITE

An Eastman Plastic

Information regarding Tenite is obtainable through representatives located in Chicago, Cleveland, Dayton, Detroit, Leominster, Mass., Los Angeles, New York, Portland, Ore., Rochester, N. Y., St. Louis, San Francisco, Seattle, and Toronto, Canada; and elsewhere throughout the world from Eastman Kodak Company affiliates and distributors.

PROVED!

...for fast, accurate molding!

-the new DeMattia Injection Presses

The fact that DeMATTIA Molding Presses and Molding Equipment are specified year after year, by molders throughout the world is proof of their dependability. One sure way to better plastic production is the specification of DeMATTIA machines and DeMATTIA molds in your plant.

Rugged Hydraulic Horizontal Press—

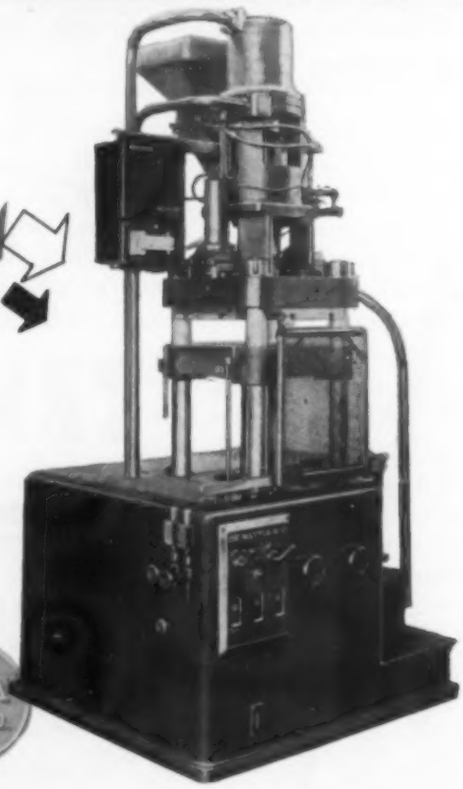
An efficient DeMATTIA press featuring proper design, finest workmanship and materials and built to function smoothly in heavy, continuous service. Solid base and tension members, open feed for visual inspection and fast, contamination-free color changing are only a few of the many advantages. Available in 6, 12 and 24 ounce capacities.

New Vertical Injection Press—

Suitable for general injection molding, the DeMATTIA Vertical Type performs excellently on exacting insert work. Compact design requires a minimum of floor space in the molding plant. Furnished in 4 and 12 ounce capacities. Complete data and specifications sent promptly on request.

DeMattia Complete Molding Equipment—

DeMATTIA Machines for the molding industry include injection presses, scrap granulators and cutters for quick handling of even large scrap material. DeMATTIA scrap grinders make it possible for molders to save valuable storage space and eliminate costly processing charges. For the molder requiring assistance on design, DeMATTIA will plan and make molds that will help assure successful molding. WRITE FOR ILLUSTRATED LITERATURE.



DE MATTIA MACHINE and TOOL CO., CLIFTON, NEW JERSEY

New York Sales Office: 50 Church St. • Cable Address: Bromach, N. Y.

From the standpoint of heating there are two basic reasons for the first stage of the new molding process. First, the temperature of the material is rapidly raised from a non-critical to a critical point in the press. Therefore it may be immediately transferred into the die cavities without any unnecessary handling delay, although moisture control delay defers this action somewhat. Furthermore, this operation is automatically and accurately timed by the cycle controller. Second, the rapid rise in temperature (75 to 150° F. in less than 3 sec.) of the material charge means that it can be taken to a higher temperature and condition of lower viscosity than is possible with conventional single stage methods. This results in lower transfer pressures, faster transfer times, faster cures, and consequently faster cycles.

The mixing action of the process makes it impossible to mold mottled parts with conventional materials. A mottled effect may be obtained, however, if the mold charge is made up of preforms of different colored materials alternately spaced in the loading chamber. The low temperature preheat requirement in combination with the mixing action inherent in this process makes practical the use of inexpensive, easily maintained dry oven preheaters and relatively long preheat cycles. By this means excess and undesirable moisture may be removed from the material before the loading pot is charged.

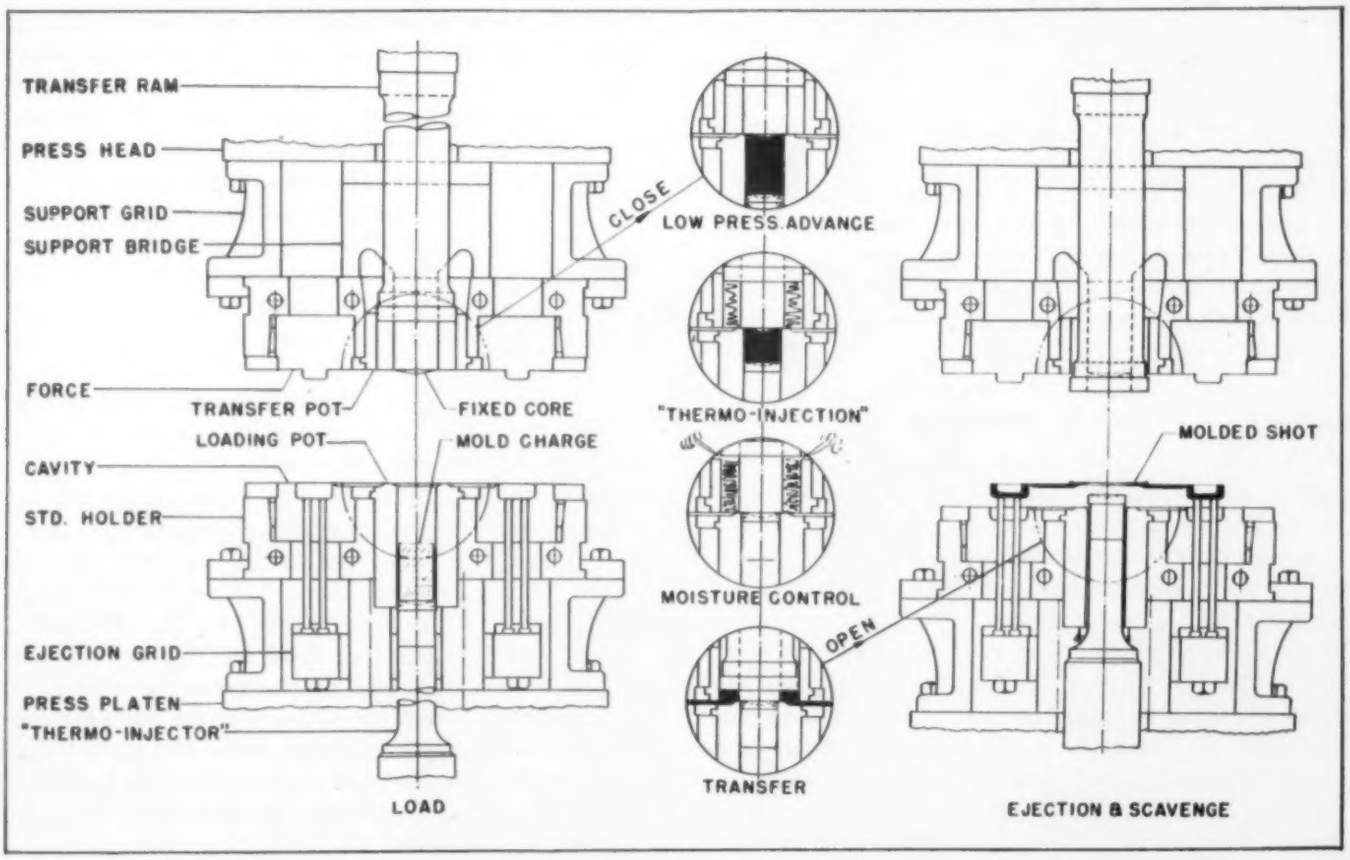
The importance of moisture control in plastic molding cannot be over-emphasized. The electrical and physical characteristics of the molded part depend upon this control. Shrinkage and warpage are governed by not only the average moisture content of a molded part but also the specific moisture content at every section of the part. Specific moisture content control becomes increasingly more difficult as transfer times are speeded up. With fast transfer rates it is essential to maintain the moisture content in the molded part at the lowest practical limit if close dimensional tolerances are required. The moisture control feature inherent in the Tri-dyne process will be of considerable aid to the molder faced with the problem of producing plastic parts of specific physical characteristics and to close dimensional tolerances.

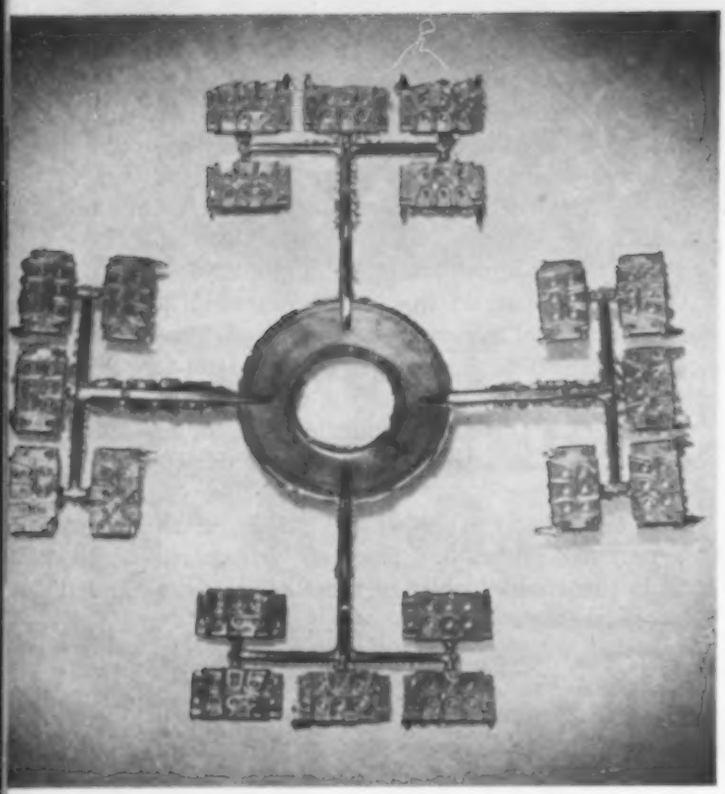
The following information, based on known thermodynamic laws and checked by experimental tests, is presented to clarify the theory behind the Tri-dyne process.

Friction heating

So-called "friction" heating is almost wholly dependent upon the conversion of pressure energy to heat energy if the pressure involved is of the high order required in the molding of thermosetting plastics. When a material is forced through a restricted opening—an annular orifice in this case—the pressure on the inlet side of the restriction is greater than the pressure on the outlet side. The difference be-

Steps in the new molding process which provides fast cycles, thorough mixing, and accurate moisture control





Complete shot produced by new molding process, as it comes from the press, before flash has been removed

tween these pressures is termed pressure drop. With a given material the greater the pressure drop the greater the heating. With a given pressure drop the heating effect remains essentially constant regardless of the speed at which the material is forced through the orifice. For example, if a pressure drop of 10,000 p.s.i. across a 0.030-in. orifice forces 8 oz. of material through the orifice in 8 sec., the quantity of heat added to the material will be substantially the same as if the same pressure drop was used to move 8 oz. of material through a 0.060-in. orifice in 2 seconds.

Tests have shown that materials pick up or lose very little heat by conduction to the surrounding medium when they are forced through restrictions at rapid rates.

Energy conversion

The following figures are approximate and depend specifically upon the characteristics of the material used. With general purpose thermosetting plastics, when converting pressure energy into heat energy, a 1000 p.s.i. pressure drop will raise the temperature of the material about 5 to 6° F. if no moisture is evaporated. The amount of heat required to evaporate 1% of moisture is approximately equal to the heat required to raise the temperature of the material 25° F. Taking a specific example, if we push material rapidly through a restriction at a pressure drop of 25,000 p.s.i. and during this time 2% of moisture evaporates from the material and is lost from the system, the resulting temperature rise would be,

$$(25 \times 6) - (2 \times 25) = 100° \text{ F.}$$

The loss of heat due to evaporation of moisture takes place only if such moisture vapor escapes from the system and not if it is recondensed due to subsequent application of pressure. In this case the heat necessary to evaporate the moisture is recovered when the moisture vapor is recondensed into the material. In the above example, if the 2% moisture did not leave the system but was later condensed due to application of pressure on the material in the transfer pot, then the temperature rise would be

$$25 \times 6 = 150° \text{ F.}$$

The condensation of moisture due to application of pressure results in a rapid increase in the temperature of the material. This phenomena, in certain instances, has been mistakenly attributed to an exothermic reaction in the material. This rapid rise in temperature, resulting from the condensation of moisture vapor, may burn certain heat sensitive materials if the vapor, prior to application of pressure, has collected non-uniformly in a pocket of the material. This results in "spot" over-heating of the material. By maintaining a unit pressure of from 200 to 250 p.s.i. in the transfer pot during "thermo-injection" this condition is corrected. In other cases, burning of material may be prevented by allowing more moisture vapor to escape from the system during the second stage.

Production records

From the standpoint of speed and quality control, our production record to date has been exceptionally good. Comparative tests under similar operating conditions (material, mold temperature, etc.) have shown that the weekly production of the presses using the Tri-dyne process has been 20 to 90% greater than that of single stage plunger presses with H. F. preheat. Furthermore, the unit transfer pressure and total clamping force required in the Tri-dyne process was only 50% of that required in the single stage method. The 90% production increase was achieved in comparative tests using the same mold and material.

In molding a 5/16-in. thick blister-free part of BM 3200 at a mold temperature of 315 to 325° F. only 20-sec. total time was required for transfer and cure.

The Defiance Tri-dyne molding press does not require an experienced operator. Inexperienced men have frequently been "broken in" on these presses during our production tests. After one shift these men produce 80 to 90% as much as the old hands. One of the important reasons for this is that the material charge handled by the press operator is in a non-critical state. This means that the operator can gradually become accustomed to the fast cycle without fear of having rejects due to delays in handling the material charge or those resulting from the mold scavenging operation.

FLAME POLISHING with the Oxy-hydrogen Torch

FABRICATORS of clear plastics have developed a new use for the oxy-hydrogen flame in finishing sawed edges of these materials. Sawing produces an opaque surface which must be made clear again. Sanding, buffing, and polishing with powder or rouge have been used to restore this transparency, but the new procedure requires only a minimum of sanding and one or two rapid passes of the oxy-hydrogen flame over the sawed surfaces. This flame treatment produces an improved finish in less time than that of earlier polishing methods, and at considerably less cost. Flame-polishing also removes surface scratches and minor imperfections.

Most of the work on flame-polishing of plastics up to the present has been done on acrylics, although it is claimed that the process produces satisfactory results with polyethylene. Trials with a number of other plastics produced undesired distortion, and polystyrene was markedly crazed.

Originally this work made use of an oxy-acetylene flame. However, after some research work it was found that an oxy-hydrogen flame was superior because there is no high temperature inner cone to the oxy-hydrogen flame and the temperature throughout any cross section of the flame feather is uniform. Another advantage of oxy-hydrogen is that no carbon residue is left on the work after flame polishing.

In some cases, the transparency of rough-sawed surfaces is restored by flame-finishing alone; in others, flame-polishing is preceded by sanding with a wet or dry sander, using 180 grit paper followed by 320 grit paper.

A standard W-29 welding blowpipe with No. 12 head is adjusted to produce a highly oxidizing flame for the polishing operation. Plastic parts are positioned in a jig or on a flat bench surface so that the edge to be polished lies horizontally. The flame is kept at a distance of approximately 3 in. above the surface of the piece. Dipping the part in water immediately before applying the flame sometimes adds to the finished appearance.

Rough-sawed, unsanded edges usually require two passes of the flame at a speed of 10 to 20 ft. per minute. Material 1 1/6 to 2½ in. wide, which has been sawed and rough sanded, requires only one pass at a speed of 40 to 60 ft. per minute.

Clear concave or convex edges are easily formed with an excess oxygen flame when copper chill bars are placed on either side of the edge to be finished. If the bars are brought up flush with the edge of the material, a slow pass of the flame across the face of the edge produces a polished concave surface. If the bars are moved back about ¼ in. from the edge, the same procedure produces a convex surface. Such chill bars also can be used to polish square edges by setting them back slightly from the edge and passing the flame rapidly.

It is well to caution prospective users of this process that it is not simple. Only a highly skilled operator should undertake production polishing of this type because of the need for careful control of flame temperature and of speed in passing the flame across the plastic surface. If great care is not taken, there is danger that the heat will decompose the material or that superficial strains will be set up in the polished areas. Such decomposition and strains will result in crazed surfaces which destroy the appearance of the article and weaken it physically.

PHOTO COURTESY THE LINDE AIR PRODUCTS CO.

Two passes with the oxy-hydrogen torch make the sawed opaque edges of these acrylic rods crystal-clear. The first pass removes saw marks and imperfections; the second leaves a smooth clear surface

Here's the latest in our series to promote plastics for applications where they belong. It appears this month in TIME, DEPARTMENT STORE ECONOMIST, CHAIN STORE AGE; a special version was published last month in RESTAURANT MANAGEMENT and INSTITUTIONS.

AND.....S

He lost the load, but not the dishes!

ONE OF THESE IS THE KIND THAT CAN TAKE IT

YES, the poor fellow lost his trayful. But not a dish was broken.

You see, even a thoroughgoing beating may not break or crack tableware molded of MELMAC*. That's one of the big reasons why so many restaurants and housewives are buying it. And, in addition to break resistance, tableware molded of MELMAC offers many other time-saving, money-saving and appearance-saving properties. For example:

Only ⅓ as heavy as standard earthenware service, it nevertheless has the feel and lustre of high-grade dinnerware.

Its lovely pastel or richly brilliant colors cannot chip, peel or wear off because they go all the way through from surface to surface.

Made of a *thermosetting* plastic, it will not soften or deform in hot water . . . wash it just as you would china . . . and it is not hurt by strong soaps or typical kitchen detergents.

It keeps food hot or cold as desired, since it is a poor conductor of heat.

It is quiet in use . . . eliminates kitchen and tableside rackety-clatter created by china and earthenware.

* * * *

More and more tableware and other products identified as "Molded of MELMAC" are reaching the markets. Look for the identification via informative labels and leaflets.

** MELMAC is American Cyanamid Co.'s Reg. U. S. trade-mark for condensation products of aldehydes and amines.*

BE SURE YOU KNOW THE DIFFERENCE

Two dishes may look alike. The difference is that one is made of the right plastic, properly designed and applied. When buying, selling or making plastic products or parts, request information that will assure you they are soundly designed in the plastic best suited for the job.

QUESTIONS PLEASE! Our technical staff will be glad to help you solve problems in plastic application and design. And if our materials do not fill the bill exactly, we will cheerfully direct you to the right sources. American Cyanamid Company, Plastics Division, 32 Rockefeller Plaza, New York 20, N. Y.

Cyanamid Plastics

PLASTICS DEPARTMENT, AMERICAN CYANAMID COMPANY

BEETLE* plastics—urea-formaldehyde thermosetting molding compounds. MELMAC* plastics—melamine-formaldehyde thermosetting molding compounds, industrial and laminating resins. URAC* resins—urea-formaldehyde thermosetting industrial resins and adhesives. MELURAC* resins—melamine-urea-formaldehyde thermosetting adhesive and laminating resins. LAMINAC* resins—thermosetting polyester resins.
*Reg. U. S. Pat. Off.

...Speaking of the Right Plastic Properly Applied,

Here's an outstanding example showing Cyanamid's MELMAC* Resin Laminates

At the new Odenton Health Center, Odenton, Maryland, MELMAC resin laminates are used throughout the building . . . in waiting rooms, offices and surgery and in clinical, dressing, dispensing and examination rooms. Properties which make MELMAC resin laminates ideally suited for such use are as follows:

. . . negligible amount of water absorption, extreme hardness, resistance to staining . . . particularly desirable properties where aseptic conditions must be maintained.

. . . resistance to marring, elimination of need for painting or polishing (even ink stains are quickly and easily removed with soap and water) effect marked savings in maintenance.

. . . beautifully colored surfaces resist fading, chipping and cracking; surface does not deteriorate; factors of durability of extreme importance in a public building.

. . . chemically inert, MELMAC resin laminates impart no taste or odor when used as working surfaces.

. . . extremely resistant to common solvents, photographic chemicals and boiling water . . . highly important for surfaces in laboratory and X-ray developing rooms.

. . . smooth, hard, glossy surfaces intensify appearance of cleanliness and efficiency.

Cyanamid's MELMAC resin laminates have great structural and decorative advantages for a wide range of applications in building interiors. For technical data on whatever application you have in mind, write to Plastics Department, American Cyanamid Company, 32 Rockefeller Plaza, New York 20, N. Y.

The dispensary and examination room of the new Odenton Health Center owes much of its immaculate appearance to the fact that colorful Cyanamid MELMAC laminates were used by National Plastics Company for wall paneling, desk top and sides, window sills and frames and all other working surfaces. Consider the advantages of MELMAC laminates for *your* products.

*Reg. U. S. Pat. Off.

CLAREMONT

FLOCK-FILLED DUREZ

gave this application

"Higher than Normal Impact Strength!"

CYLINDER HEAD PARTS
Hoover Vacuum Cleaner Model 50

Prepared in Advance to Outlast Long Years of Hard Service

New, horizontal cylinder-type Hoover Cleaner makes liberal use of molded Durez... impact-strengthened with a special Claremont Flock Filler. This formulation in conjunction with ample wall thickness and generous internal ribbing produced the desired result...a toughness that will stand off a lot of pushing around.

Claremont Fillers (flock, thread, fabric, cord), provide important high-impact-resistant factors... in degrees ranging from strong to strongest. Carefully graded, uniform in bulk and processed to plastic requirements, all four types of Claremont Fillers are available for test. Inquiries invited!

Pictures, courtesy of Durez Plastics & Chemicals, Inc. No. Tonawanda, N. Y.

CLAREMONT • FLOCK THREAD FABRIC CORD

THE FILLER IS THE HEART

CLAREMONT
WASTE MANUFACTURING CO.
"The Country's Largest Manufacturer of Flock" CLAREMONT, N. H.

TECHNICAL SECTION

Cotton Fabric Laminates*

A report on a comprehensive study which has been made of the engineering properties of 7000 specimens supplied by commercial laminators

by R. K. WITT, P. D. WOLFE, and D. M. RUST†

EARLY in World War II it was realized that there was a serious shortage of information on the engineering properties of fabric base thermosetting laminates. Information had been published by the various laminators but there had not been a comprehensive study of the products of the industry as a whole. The Johns Hopkins University was selected by the Technical Committee and the Technical Advisory Committee of the Laminated Products Section of the National Electrical Manufacturers Association to make such a study and the costs of equipping the laboratories and financing the work was borne by the industry.

Samples of N.E.M.A. Grade L, a fine weave cotton fabric base material, were supplied by 10 of the member laminators. Samples of N.E.M.A. Grade C, a coarse weave cotton fabric base material, were supplied by 11 of the member laminators. Along with the samples of material the manufacturers supplied complete information regarding fabric weight, fabric construction, resin content, press temperature, molding pressure, cure time cycles and other pertinent information. This is to the writers' knowledge the first time an industry has cooperated with a disinterested party to assemble a picture of the products of the industry, and what they will do.

Since approximately 7000 specimens were tested giving about 11,000 property values, it is impossible to include the detailed results in this report. Minimum, average, and maximum values are given for most of the properties as well as directional values where determined. The minimum and maximum values are the minimum average and maximum average observed when the results for each laminator's product are averaged separately. The average value reported in Table I was calculated from the averages computed for each laminator's product. In general, four specimens of each laminator's product were tested for each property. Whenever a test was conducted at more than one temperature, the percentage change in the property value is given in terms of the room temperature value. All property values are reported for a temperature of 77° F.

The methods of Federal Specification L-P-406, dated December 9, 1942, have been followed with such modifications as were authorized by the project advisors. One of the major problems was the design and construction of jigs and fixtures so that specimens could be prepared and tested on a production basis without sacrificing accuracy. The number and variety of special fixtures necessary was greatly increased by the request for test data at —70° F. and

* Presented before the Rubber and Plastics Div., American Society of Mechanical Engineers, and published here through the courtesy of that Society.

† Department of Engineering, Johns Hopkins University.

1 — Universal testing machine which is used for mechanical strength tests

Table I. — Summary of Properties of Grade L and Grade C Laminates

Property	Grade L			Grade C		
	Maximum	Average	Minimum	Maximum	Average	Minimum
Density 25°/4°, g./cm.	1.34	1.37	1.30	1.37	1.35	1.32
Water absorption, %	1.67	1.28	0.82	1.99	1.24	0.71
Compressive strength						
Flatwise						
⅛ in. thick p.s.i.	40,400	38,600	35,900	45,000	40,800	38,100
½ in. thick, p.s.i.	43,500	40,700	38,500	46,300	41,500	37,000
Edgewise, ½ in. thick						
Machine direction, p.s.i.	25,500	23,300	21,700	25,100	23,300	20,500
Cross direction, p.s.i.	24,000	22,500	21,200	24,800	23,200	21,100
Compressive modulus of elasticity						
Flatwise						
⅛ in. thick, p.s.i.	757,000	655,000	572,000	741,000	660,000	563,000
½ in. thick, p.s.i.	768,000	673,000	528,000	730,000	658,000	492,000
Edgewise, ½ in. thick						
Machine direction, p.s.i.	1,260,000	1,100,000	813,000	1,210,000	1,030,000	745,000
Cross direction, p.s.i.	1,100,000	945,000	794,000	1,070,000	980,000	890,000
Tensile strength						
Machine direction, p.s.i.	17,800	15,000	12,300	15,700	11,300	8,000
Cross direction, p.s.i.	12,000	9,600	8,300	11,100	9,700	7,700
Elongation in 2 in.						
Machine direction, in.	0.081	0.066	0.045	0.093	0.073	0.055
Cross direction, in.	0.094	0.067	0.035	0.111	0.079	0.030
Tensile modulus of elasticity						
Machine direction, p.s.i.	1,370,000	1,180,000	1,020,000	1,350,000	1,070,000	924,000
Cross direction, p.s.i.	1,060,000	906,000	805,000	1,130,000	990,000	872,000
Flexural strength, maximum fiber stress						
Flatwise, ⅛ in. thick						
Machine direction, p.s.i.	27,600	24,000	21,300	26,900	21,100	17,100
Cross direction, p.s.i.	21,900	18,400	15,600	21,600	19,000	16,400
Edgewise, ½ in. thick						
Machine direction, p.s.i.	24,900	22,200	16,800	25,000	19,400	15,500
Cross direction, p.s.i.	21,600	19,200	16,600	20,600	18,700	16,200

160° F., temperatures which may be encountered under operating conditions in the tropics, the arctic, or at very high altitudes. Insulated cabinets were constructed in which the testing equipment or parts of it could be operated by a technician using gloves mounted in the cabinet wall and observing the test through a window mounted in the same fashion.

In each test conducted at either high or low temperature, measurements of the air temperature, fixture or jig temperature, and temperature at the center of a typical specimen were made to establish thermal conditions definitely. Micrometers were checked by means of gage blocks; the Olsen Plastiversal testing machine was checked using ring gages calibrated by the National Bureau of Standards; compressometers and extensometers were checked by means of micrometers in special fixtures.

Equipment

Compression, tension, flexure, bearing, and shear tests were made on an Olsen Plastiversal testing machine (Fig. 1) equipped with electronic compressometers and flexometers. Flexural fatigue tests were made on Krause type machines. A Baldwin Southwark impact machine of the type designed by the Bell Telephone Laboratories was used to obtain data on impact strength. The temperature of the various insulated cabinets was controlled by supplying them with either cooled or warmed air from a unit supplied by the Tenney Engineering Co. Precision-Freas ovens having forced air circulation were used for conditioning samples at high temperatures. The laboratories were maintained at 77° F. and 50% relative humidity by means of a Trane Air Conditioner.

Density

The density of the materials was determined by dividing the weight of the sample in air by the volume of the sample as computed from the micrometer measurements of a sample approximately 3 by 1 by ⅛ inch. Care was taken to have all surfaces

Table I (continued)

Property	*Grade L*			*Grade C*		
	Maximum	*Average*	*Minimum*	*Maximum*	*Average*	*Minimum*
Flexural modulus of elasticity						
Flatwise, ⅛ in. thick						
Machine direction, p.s.i.	1,480,000	1,170,000	961,000	1,560,000	1,110,000	902,000
Cross direction, p.s.i.	1,060,000	905,000	727,000	1,130,000	982,000	858,000
Edgewise, ½ in. thick						
Machine direction, p.s.i.	1,340,000	1,150,000	868,000	1,360,000	1,080,000	778,000
Cross direction, p.s.i.	1,080,000	977,000	793,000	1,220,000	1,050,000	936,000
Bearing strength						
At 4% deformation						
Machine direction, p.s.i.	21,100	17,600	13,500	20,000	16,700	13,600
Cross direction, p.s.i.	22,400	17,500	14,900	19,800	17,100	12,000
Ultimate						
Machine direction, p.s.i.	53,600	46,700	41,200	58,500	48,900	42,000
Cross direction, p.s.i.	46,400	40,900	37,700	49,400	45,000	41,200
Shear strength						
Flatwise, ⅛ in. thick						
Machine direction, p.s.i.	14,900	14,100	13,000	14,000	12,900	11,800
Cross direction, p.s.i.	13,300	11,800	10,100	13,100	12,300	11,300
Edgewise, ⅛ in. thick						
Machine direction, p.s.i.	15,400	14,500	13,300	16,300	14,100	13,100
Cross direction, p.s.i.	14,600	12,800	11,800	14,800	13,300	11,000
Flatwise, ½ in. thick						
Machine direction, p.s.i.	16,500	15,000	13,200	15,800	14,100	11,700
Cross direction, p.s.i.	15,300	13,900	12,800	15,000	14,100	12,900
Edgewise, ½ in. thick						
Machine direction, p.s.i.	17,100	15,600	14,500	17,000	14,900	12,400
Cross direction, p.s.i.	15,800	14,400	12,900	15,800	14,500	13,300
Izod impact strength						
Flatwise						
Machine direction, ft.-lb./in. of notch	5.4	4.1	3.4	6.3	4.5	3.5
Cross direction, ft.-lb./in. of notch	5.5	3.5	2.5	6.8	4.3	3.4
Edgewise						
Machine direction, ft.-lb./in. of notch	2.4	2.0	1.8	3.4	2.5	2.1
Cross direction, ft.-lb./in. of notch	2.4	1.5	1.2	3.7	2.4	1.9

smooth and parallel. A number of specimens were checked using the water immersion method and the two methods found to check satisfactorily. It should be noted that the term "density" in the figures which are reported in Table I is synonymous with specific gravity.

Water absorption

All of the laminates were tested for water absorption using A.S.T.M. method D 570-42, but without correcting for the water soluble ingredients. In addition to the requirements of this method, a rack was constructed for the constant temperature bath so that the specimens would be freely supported. The specimen size was 3 by 1 by ⅛ inch. The results are reported in Table I.

Compressive strength

The compressive strength and the modulus of elasticity of the two grades of material in thicknesses of ½ and ⅛ in. were determined. Flatwise tests on ½-in. material were made in duplicate only, using a pile of specimens 1-in. square with sufficient layers to produce a height of 1 inch. Edgewise tests on ½ in. material were made in quadruplicate, using a specimen ½ by ½ by 2 inches. The motion of the crosshead of the machine was 0.050 in. per min. in all cases. The results are recorded in Table I.

Tensile and flexural strengths

Figure 2 shows a tensile specimen being tested in the temperature cabinet with the front removed. Figure 3 shows the front of the cabinet equipped with electrically heated gloves for use at low temperatures. The extensometer used in all tensile tests is one which may be left on the specimen until it breaks. In using the extensometer at high and low temperatures it was found necessary to insert variable resistors in the two arms of the inductance bridge to compensate for the effect of temperature on the direct current component of resistance in

(*Please turn to page* 184)

Volatile Loss in Molding Lignocellulose-Filled Phenolics

by R. V. WILLIAMSON*

Quantitative data are presented to show the amount of volatile matter in lignocellulose-filled phenolics molded for different lengths of time at various temperatures from preforms that were preheated for different time intervals. The results show that the volatile content of molded specimens was reduced but not eliminated by preheating, because volatile matter was produced during the molding operation. Increasing the molding temperature or the time of molding increased the volatile content. However, it was possible to obtain a lower volatile content at the higher molding temperature because longer preheats and shorter molding cycles could be used. Minimum volatile content was obtained by combining maximum preheat with minimum molding time.

Experimental results are presented to show that the method given for the determination of water-soluble extractives in A.S.T.M. specification D 570-42, in connection with the water-absorption test, is not applicable under the conditions of these experiments and the need for further study of this feature of the specification is suggested.

BECAUSE of the shortage of phenol and formaldehyde during the war, an investigation was made at the Northern Regional Research Laboratory on the use of agricultural residues in plastic molding compounds of approximately half (25%) of the resin content normally used in commercial practice. The flexural and tensile strengths of these compounds were equal to or better than for compounds with the normal resin content of 47 to 50% and readily met the specifications for general purpose phenolics[1]. The water absorption properties of these compounds met the specification of 0.80% for general-purpose phenolics when determined by the gain in weight of the specimen after immersion in water. However, according to A.S.T.M. specification D 570-42, account must be taken of the loss in weight of the specimen as the result of water-soluble materials removed from it during immersion[2], and this weight must be added to the gain in weight from immersion for calculating the total water absorbed.

The A.S.T.M. specification defines the method for determining the water-soluble materials removed from the specimen. The method is not a direct one, but indirect. It is based on the difference in weights of the specimen after conditioning for 24 hr. at 50° C. before immersion and reconditioning for 24 hr. at the same temperature after immersion. When this method was used at this Laboratory for determining water-soluble materials removed from the specimen, the results obtained indicated that the method was not applicable under the conditions of the experimental work. In some cases the apparent extractives, using the same molding powder, varied from 0.06 to 0.55%, depending upon the amount of preheating given the molding powder. In other cases the specimen weighed more after reconditioning than it did after the first conditioning period. The addition of a small amount of water to either a commercial or experimental molding powder caused a decided increase in apparent water-soluble materials. All of these experiments indicated that the results obtained depended upon the amount of moisture in the molded specimen and that the conditioning periods were not long enough to dry the specimens to constant weight, which is an essential feature of the method if it is to be a measure of water extractives.

The amount of moisture in molded specimens appeared to have an important bearing on the A.S.T.M. method for determining water-soluble extractives. It is also important in connection with such other properties as warping, internal checking, shrinkage, electrical resistance, and cracking on long periods of storage[3-9]. Hence, a study was made of the moisture or volatile content of molded specimens under various preheating and molding conditions as well as the rate of removal of volatile matter under various conditions of drying.

Materials used

An experimental and a commercial compound recommended for molding bottle caps were used in

* In charge, Plastics and Building Materials Section, Agricultural Residues Div., Northern Regional Research Laboratory, Peoria, Ill. This is one of the laboratories of the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, U. S. Department of Agriculture.

1 "Agricultural residues in plastics," by R. V. Williamson, T. F. Clark, and T. R. Naffziger, MODERN PLASTICS *23*, 177 (Feb. 1946).

2 "Sorption of water by plastics," by O. M. Kline, A. R. Martin, and W. A. Crouse. Proc. A.S.T.M. *40*, 1273-1283 (1940); MODERN PLASTICS *18*, 119-123, 152-154 (Oct. 1940).

3 "Processing phenolic molding materials," by Frank Donohue, MODERN PLASTICS *23*, 143 (Sept. 1945).

4 "Injection molded thermosetting parts," by A. R. Morse. MODERN PLASTICS *20*, 42 (Nov. 1942).

5 "Time and temperature control for compression molding," by Arthur Herman, MODERN PLASTICS *23*, 138 (Dec. 1945).

6 "History of plastics and their uses," by G. M. Kline, MODERN PLASTICS *18*, 65 (Sept. 1940).

7 "Chemistry of synthetic resins," by C. Ellis, Vol. 2, p. 1344.

8 "Handbook of plastics," by H. R. Simonds and C. Ellis, p. 771.

9 "Linear shrinkage of phenolic moldings," by S. W. Hargreaves and J. H. Martin. British Plastics *19*, No. 216, 216-221 (May 1947)

the experiments. The composition of the experimental compound was as follows:

Flax-shive flour	58.4%
Phenol-formaldehyde resin	24.3%
Vinsol-formaldehyde soap[10]	14.6%
Calcium oxide	0.2%
Zinc stearate	0.5%
Black dye	2.0%

The commercial compound was reported to contain 50% woodflour and 47% phenol-formaldehyde resin plus small amounts of dye, lubricant, and catalyst.

Different conditions of drying

Bottle caps 1⅛ in. in diameter and ½ in. high were molded at a temperature of 320° F. and a pressure of 3000 p.s.i. for 2½ min. without preheat and subjected to the following drying conditions:

1. Heated at 221° F. in a forced-draft electric oven.
2. Heated at 122° F. in a forced-draft electric oven.
3. Heated at 122° F. in a convection electric oven.
4. Stored in a desiccator over anhydrous calcium chloride at room temperature.

The specimens were kept under the above conditions for nearly two months, being weighed at intervals to determine rate of volatile loss. The results of these experiments are shown graphically in Fig. 1. Curve I shows the percent loss with time for the commercial bottlecap compound when heated at 221° F. in a forced-draft oven. This curve is presented for comparison with Curve II, which shows the percent loss for the experimental compound when heated under the same conditions. The results show that the experimental compound was not unusual with respect to the amount and rate of volatile loss since it showed essentially the same results as those of the commercial compound. Curve III for the experimental compound shows the volatile loss with time at 122° F. in a forced-draft oven. This curve represents the drying conditions prescribed by A.S.T.M. specification D 570-42, for the determination of water-soluble extractives. The important feature of this curve is the fact that it shows the specimen was losing weight comparatively rapidly at the end of 48 hr. and had not reached constant weight at the end of 1000 hours. In order for the A.S.T.M. method to be applicable to the determination of water-soluble extractives the specimen should have reached constant weight after heating for 24 hours. The difference in loss in weight between the first and second heating periods of 24 hr. each was 0.35 percent. This loss could not have been water-soluble extractives since the specimen had not been immersed in water. These results show that the A.S.T.M. method for determining water-soluble extractives was not applicable in this case and indicate the need for further study of this feature of the specification.

It is generally recognized that preheating the molding powder reduces the moisture content of molded specimens, and that moisture is produced in the specimen during the molding operation. However, nothing was found in the literature concerning the amount of volatile matter present in molded specimens when preheated and molded under different conditions. Hence, a study was made to determine the effect of the time of preheat and the time and temperature of molding on the volatile content of molded specimens.

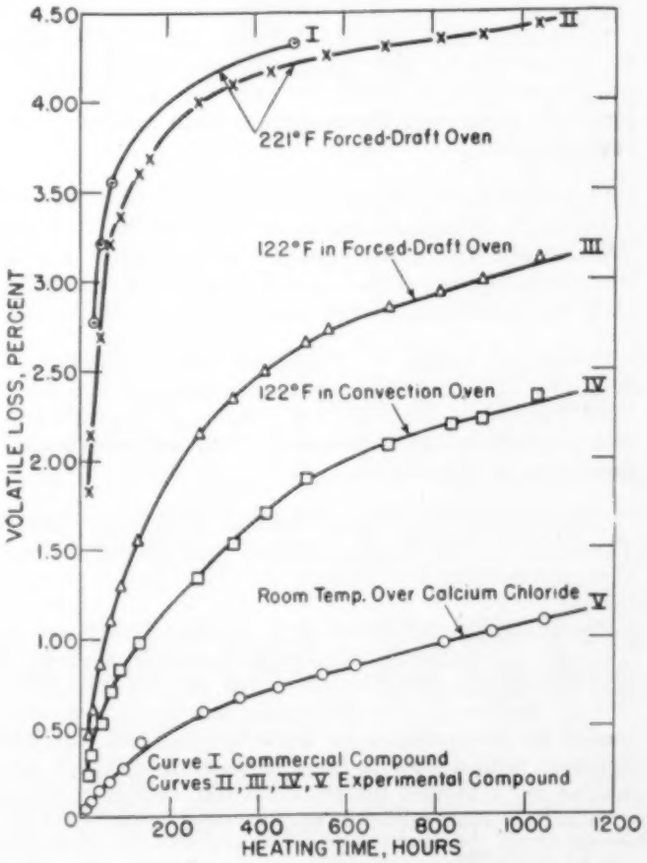
Bottle caps were molded from the experimental compound at temperatures of 320 and 380° F. and a pressure of 3000 p.s.i. from preforms that were preheated in a convection oven at 221° F. for different time intervals. The molded specimens were heated for 250 hr. at 221° F. in a forced-draft oven to determine the volatile content. The results of these experiments are shown in Table I. The volatile loss of the preforms when heated at 221° F. for different lengths of time was also determined, and the results are shown in Table II.

Effect of time of preheat

Specimens molded at 320° F. for 2½ min. without preheat showed a volatile loss of 3.95% and with a 10-min. preheat, 2.05 percent. It was not possible to preheat the preforms longer than 10 min. when molding at a temperature of 320° F. because flow of the

(*Please turn to page* 183)

1 — Results of varying the drying conditions of bottle caps molded at the same temperature and pressure



[10] The use of this commercial product in these experiments does not imply that it is endorsed or recommended by the Department of Agriculture over others of a similar nature not used.

PLASTICS DIGEST*

Abstracts from the world's literature of interest to those who make or use plastics or plastics products. Send requests for periodicals direct to the publishers listed

General

CARBIDE UNVEILS VINYON N PLANT. Chem. Eng. News *26*, 746-7 (Mar. 15, 1948). The production of a new synthetic fiber, a copolymer of vinyl chloride and acrylonitrile, is described. This resin is resistant to chemicals and solvents, does not support combustion, is water resistant, has good electrical properties, is readily dyed, is easily fabricated, is resistant to vermin, and is thermoplastic.

BEHIND THE MARKETS. H. Stenerson. Chem. Eng. News *26*, 808 (Mar. 15, 1948). The market for plastics is analyzed. The production of resin coating materials is not expected to meet the demand. The outlook for moldings is less satisfactory although the volume of business in 1947 was large.

PROOFING OF PAPER. M. L. Downs. Modern Packaging *21*, 128-30 (Jan. 1948). The proofing of paper has expanded beyond mere waterproofing to include proofing against mold, flame, grease and loss of strength when wet, using new impregnants, coatings or combinations with other materials. Materials and processes currently being used to impart new and improved functions to papers such as are used in the construction of fibre drums, fibre cases and bulk wrappers are described.

Applications

INDUSTRIAL ADHESIVES. N. J. De Lollis. Product Eng. *18*, 117-22 (Nov.) and 137-42 (Dec. 1947). The types, properties and applications of vegetable, protein, thermoplastic resin and thermosetting resin adhesives are reviewed.

PLASTIC TOOLING STRONG, INEXPENSIVE, AND EASY TO PRODUCE. L. Wittman. Materials & Methods *27*, 87-92 (Feb. 1948). The production and use of forming tools made from laminated plastics are described. These materials are capable of wide applications in the field.

SUBMARINE CABLE. H. F. Wilson. British Plastics *20*, 20-6 (Jan. 1948). A submarine cable in which the principal insulating material is a mixture of polyethylene and polyisobutylene is described. Detailed technical information on the plastic is given.

NYLON ROPES FIND NEW USES. J. D. Glenn. Plastics (London) *11*, 569-70 (Nov. 1947). Applications of nylon rope are described.

PERMEABILITY OF PROTECTIVE GLOVE MATERIALS TO TETRAETHYLLEAD AND ETHYLENE BROMIDE. G. Calingaert and H. Shapiro. Ind. Eng. Chem. *40*, 332-5 (Feb. 1948). A considerable number of plastics and elastomers were tested for permeability to tetraethyllead and ethylene bromide, with a view to the manufacture of better protective work gloves; the principal test employed was a gravimetric disk diffusion test. Several materials were shown to be from 10 to over 1000 times as impermeable to these liquids as neoprene. Most of the impermeable materials were unsuited for glovemaking, but the nylons seemed promising and were investigated extensively. Gloves were fabricated of nylon alone and also of nylon compounded with neoprene, and the nylon-neoprene gloves are now in commercial production. A gravimetric method of testing the gloves is described.

Materials

SUBSTITUTED STYRENES MODIFY POLYMER PROPERTIES. F. W. Reinhart. Chem. Ind. *62*, 235-7 (Feb. 1948). The chemistry of styrene and substituted styrenes is reviewed. The effect of these substituent groups on the properties of the polymer are considered. This information is taken from one of the papers given at a technical symposium on NBS Casting Resins, National Bureau of Standards, October 16, 1947. Mimeographed copies of all the papers may be obtained by applying to that agency at Washington 25, D. C.

FURAN RESINS. A. J. Norton. Ind. Eng. Chem. *40*, 236-8 (Feb. 1948). A review of the advantages of the furans as base chemicals for synthetic resin and high polymer work is given. The five basic reactions now utilized industrially in resin work are reviewed, and the advantages accruing from these are discussed in some detail. Particular emphasis is given to the methods of evaluation of plastic materials by tests on rate of flow. In addition to the utilization of the furans by the standard reactions now used, the possibilities of the newer and less understood reactions are emphasized.

PAPER IMPREGNATION PLANT. British Plastics *20*, 38-40 (Jan. 1948). A continuous impregnating and drying equipment for paper is described.

Coatings

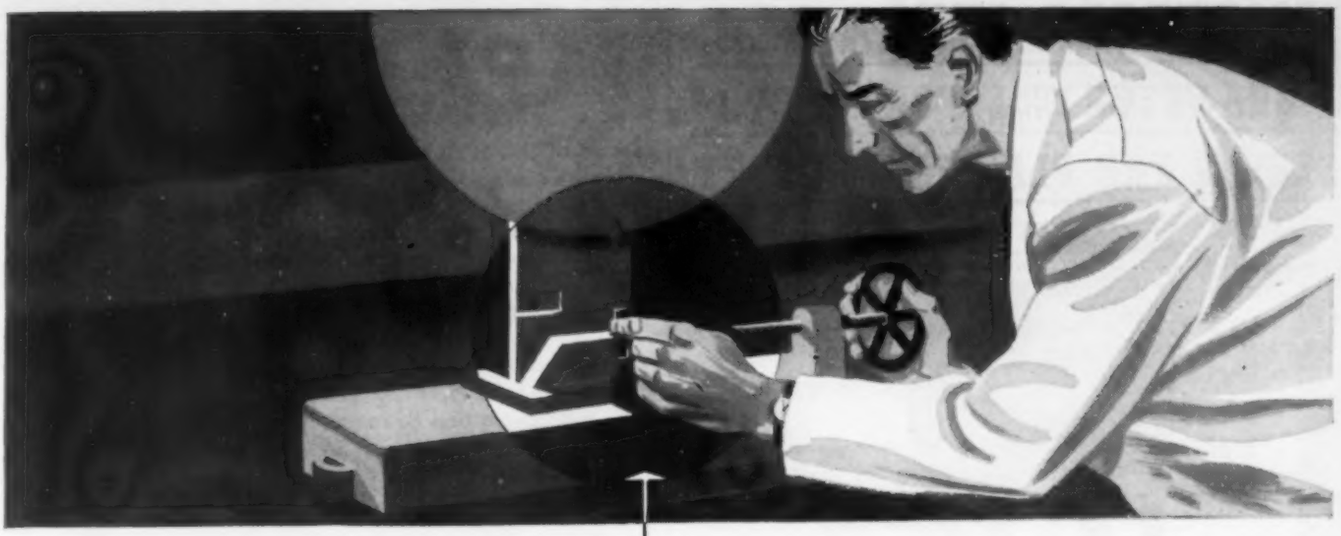
SYNTHETIC ENAMELS FOR INSULATION OF COPPER WIRE. C. R. Pye. Plastics (London) *11*, 625-9 (Dec. 1947) and *12*, 21-4 (Jan. 1948). The formulation and properties of enamels based on synthetic resins for the insulation of copper wire are described. Polyvinyl ethers, polyamides, resins made from furfural, resins made from cashew nut oil, melamine-formaldehyde resin, styrene copolymers, polyacrylates, polyisocyanates, maleic anhydride copolymers, and silicons are considered; 60 references.

Chemistry

MOLECULAR STRUCTURE AND ITS INFLUENCE ON THE PROPERTIES OF PHENOLIC RESINS. N. J. L. Megson. British Plastics *20*, 27-31 (Jan. 1948). Concepts on the structure of phenolic resins are discussed. Future lines of work which may be of interest on this problem are considered.

ALLYL AND METHALLYL ESTERS OF SOME ARYLPHOSPHONIC ACIDS. A. D. F. Toy. J. Am. Chem. Soc. *70*, 186-8 (Jan. 1948). The preparation of dichlorophenyl-, dichlo-

*Reg. U.S. Patent Office.



the tougher the end use, the more you'll value

No. 5010 PLYOPHEN

for tubing, sheet stock, bearings

Here's a fast-curing, low-pressure straight phenol varnish assuring paper or canvas laminates of utmost mechanical strength. Used in the production of a sheet ½ inch thick, for example, it cures in 45 minutes under 70 to 80 pounds of steam pressure. Recommendations for proper curing cycles and pressures for particular applications may be secured by writing direct to the Sales Department at Detroit.

REICHHOLD CHEMICALS, INC. RCI

General Offices and Main Plant, Detroit 20, Michigan

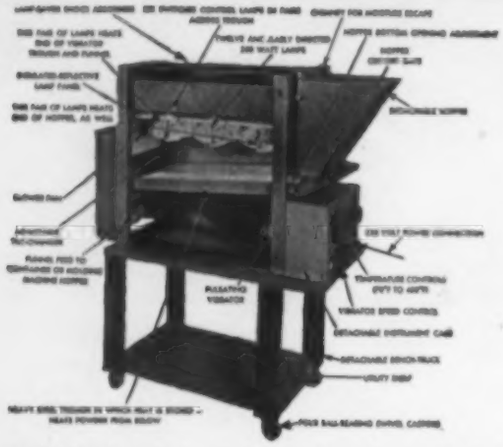
Other Plants: Brooklyn, New York • Elizabeth, New Jersey • South San Francisco, California • Seattle, Washington • Tuscaloosa, Alabama
Liverpool, England • Paris, France • Sydney, Australia • Zurich, Switzerland • Milan, Italy • Buenos Aires, Argentina

SYNTHETIC RESINS • CHEMICAL COLORS • PHENOLIC PLASTICS • INDUSTRIAL CHEMICALS

MISKELLA INFRA-RED

VIBRA-VEYOR WITH OR WITHOUT PORTA-VEYOR

SERVES THE PLASTIC INDUSTRY



The dream of delivering plastic powder exactly as it comes in the shipping drum without exposure or the need of human handling has at last been achieved. Now a full drum will feed for hours without further attention. Ask for new circular.

THE MISKELLA *Infra-Red* COMPANY

Designers-Manufacturers of

INFRA-RED OVENS · APPLIANCES · SECTIONAL UNITS · MACHINES AND CONVEYORS

MAIN OFFICE AND LABORATORY
EAST 73RD AND GRAND AVENUE
CLEVELAND 4 OHIO

COTTON FABRICS

FOR REINFORCING

PLASTICS

★

J.H. LANE & CO., Inc.

250 W. 57th St. · New York, N. Y.

ro-p-tolyl- and dichloro-p-chlorophenylphosphine oxides may be accomplished readily by chlorination of a slurry of phosphoric anhydride and the corresponding dichloroarylphosphine. The dichloroarylphosphine oxides were converted into the diallyl and dimethallyl esters of the arylphosphonic acids by action of the respective alcohols in the presence of pyridine. The diallyl and dimethallyl esters of benzene-, p-toluene- and p-chlorobenzenephosphonic acids undergo peroxide catalyzed polymerization to form clear, infusible, insoluble resins and also are capable of copolymerization with various unsaturated organic compounds.

POLYMERIZATION OF METHYL METHACRYLATE. M. J. S. Dewar and C. H. Bamford. Nature *158*, 380-1 (1946). The polymerization of methyl methacrylate by light was investigated.

Properties

INFRA-RED SPECTRUM OF POLYVINYL ALCOHOL. E. R. Blout and R. Karplus. J.Am.Chem.Soc. *70*, 862-4 (Feb. 1948). The infra-red absorption spectra of several samples of polyvinyl alcohol are reported in this article.

Testing

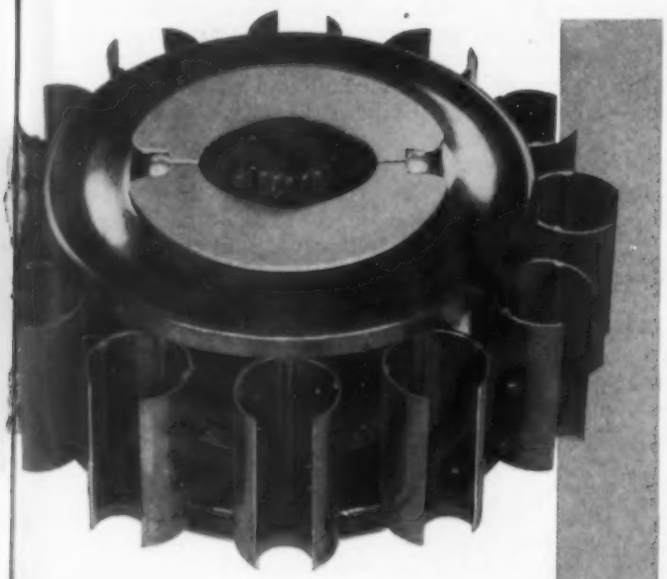
UNIVERSAL PLASTICS TESTING MACHINE. G. S. Burr, W. J. Gailus, J. O. Silvey, S. Yurenka, and A. G. H. Dietz. ASTM Bulletin *1947*, No. 149, 51-7 (Dec. 1947). A new universal testing machine specially designed for testing plastic materials is described. The capacity is 30,000 pounds. The rates of crosshead motion vary continuously from 0.005 to 30 in. per min. with positive control in either direction and with fast positive reversal in direction. The load on the specimen can be reversed without backlash when passing through zero. The grips are capable of applying loads in tension and compression continuously on the same specimen.

IDENTIFICATION OF UREA RESINS IN WRINKLE-PROOF FABRICS. J. C. Pfeiffer. Rayon Textile Monthly *27*, No. 12, 71-2 (1946). Textile materials treated with urea resins are heated with aniline to form diphenylurea. This is used in order to determine the presence of these resins in the materials.

Synthetic rubber

COPOLYMERIZATION OF BUTADIENE WITH VINYL MONOMERS. R. L. Frank, C. E. Adams, J. R. Blegen, P. V. Smith, A. E. Juve, C. H. Schroeder, and M. M. Goff. Ind. Eng. Chem. *40*, 420-2 (Mar. 1948). Most copolymers of butadiene (75 parts) with vinyl monomers (25 parts) are rubbery, but the quality of the elastomers varies greatly with that of the vinyl monomer. Of four comonomers herein described 2-vinylthiophene and methacrylonitrile form copolymers which compare favorably with GR-S; 2-vinylfuran and vinylidene chloride do not. The copolymer with 2-vinylfuran is different from GR-S; it is benzene-insoluble, produces high modulus and low elongation stocks, and has inferior flex-cracking resistance. The copolymer with 2-vinylthiophene is similar in properties to GR-S. The methacrylonitrile copolymer is also similar, but superior to GR-S in respect to the balance between hysteresis-temperature rise and flex-cracking resistance. The butadiene-vinylidene chloride copolymer is shown to be poorer than GR-S.

What makes design freedom in plastic molding?



The freedom of design possible with Styron (Dow Polystyrene) gives this poker chip rack novel sales appeal. The "Roto-Rack", manufactured by South Gate Tool Engineering Company and distributed by Turnit Mfg. Company (owners), holds a maximum number of poker chips completely protected from dirt, dust and accidental spilling. With a simple twist of the knob, the chips swing out from the rack for easy handling. This clever design utilizes Styron's facility for correct combination with metal, its high rigidity and dimensional stability. Parts are molded separately and subsequently assembled, demonstrating Styron's usefulness in the making of identical parts for mass production techniques. Again, Styron, America's No. 1 plastic, was chosen as the *right* plastic!

YOUR CHECK LIST FOR BETTER PLASTIC PRODUCTS

1. Styron's high rigidity makes possible the molding of thin walled sections and large area moldings that retain their shape. It also lends itself to the production of some structural pieces which are subject to light loads.
2. Styron has a broad range of eye-catching colors from brilliant reds, blues and yellows to soft pastels. Added sales appeal also is possible with luminescent color.
3. Styron has outstanding clarity. Its ability to pipe light around bends, its high index of refraction, makes possible many novel designs.
4. Styron can be painted or metal plated for additional sales appeal. Because it is non-corrosive, contact with metal will not affect it, thus making possible unusual combinations with metal.
5. Styron can be extruded, injection or compression molded, providing the designer with a choice of fabrication methods to achieve greater economy.
6. Styron offers excellent reproduction of the finest details contained in the mold surface. And Styron lends itself to a variety of assembly methods as it can be cemented in order to build up sections as required by design.
7. Styron offers these additional values to the plastic designer: low thermal conductivity, good chemical resistance, low moisture absorption, small, uniform mold shrinkage, excellent dimensional stability—and *low cost.*

Let's Go SELLING with STYRON!

More and more molders are finding the value of Dow's Consumer Product Evaluation Committee as a sales aid. Evaluation by technicians, buyers and consumers gives Styron products greater sales interest both to the store buyer and the consumer. Add to this product evaluation, the aggressive advertising and promotion back of Styron and you have the answer to the growing popularity of America's No. 1 plastic. Your nearest Dow office will gladly help you in putting Styron to work in your products. If you have a problem in plastics, bring it to Dow . . . "let's work it out together."

PLASTICS DIVISION, DEPT. T-13

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Cleveland • Detroit • Chicago
St. Louis • Houston • San Francisco • Los Angeles • Seattle
Dow Chemical of Canada, Limited, Toronto, Canada

U.S. PLASTICS PATENTS

Copies of these patents are available from the U. S. Patent Office, Washington, D. C., at 25 cents each

SHEET MATERIAL. R. M. Leekley (to E. I. du Pont de Nemours & Co., Inc.). U S. 2,432,242, Dec. 9. Sheet material is prepared from a monohydric alcohol-modified urea-formaldehyde resin and a polyvinyl acetal having a hydroxyl number between 60 and 275.

CHLORINE-CONTAINING POLYMERS. G. L. Dorough (to E. I. du Pont de Nemours & Co., Inc.) U. S. 2,432,296, Dec. 9. A stabilizer against deterioration by heat and light comprising an aliphatic mercapto alcohol of at least 3 carbon atoms.

CELLULOSE ESTERS. G. W. Seymour and M. E. Martin (to Celanese Corp. of America). U. S. 2,432,341, Dec. 9. Modified ripening process for production of improved cellulose esters.

CELLULAR PRODUCTS. L. E. Daly (to U. S. Rubber Co.). U. S. 2,432,389, Dec. 9. Heat-hardening a stable gelled foam of an aqueous emulsion comprising 100 parts of a water-soluble urea-formaldehyde resin, 30 to 90 parts of vinyl acetate resin, 5 to 25 parts of acrylic ester resin.

ACRYLONITRILE POLYMERS. R. A. Schneiderbauer (to E. I. de Pont de Nemours & Co., Inc.). U. S. 2,432,447-8, Dec. 9. Removing color from an article of acrylonitrile polymer by treating with an aqueous solution of hypochlorous acid at a temperature of 90 to 150° C. for not more than 30 minutes.

POLYMERS. C. C. Unruh and W. O. Kenyon (to Eastman Kodak Co.). U. S. 2,432,460, Dec. 9. The resinous copolymer of equimolecular proportions of methyl isopropenyl ketone and a 1-acyloxy-1,3-butadiene wherein the acyloxy group contains from 2 to 4 carbon atoms.

DISPENSING TUBE. H. F. Waters, U. S. 2,432,462, Dec. 9. A fluid-tight collapsible paper tube having a heat sealable inner surface formed of a thermoplastic sheet.

POLYVINYL ACETAL. F. W. Cox (to Wingfoot Corp.). U. S. 2,432,471, Dec. 9. Guanadine carbonate as a stabilizer for a polyvinyl acetal.

POLYMER. J. R. Long (to Wingfoot Corp.). U. S. 2,432,480, Dec. 9. A rubber-like copolymer of ethyl α-chlorocrotonate and butadiene-1,3.

CELLULOSE COMPOUND. H. Dreyfus. U. S. 2,432,517, Dec. 16. An ester of a monohydroxynaphthalene with an aromatic monohydroxy-monocarboxylic acid as a light stabilizer for cellulose compounds.

CELLULOSE ESTERS. W. Horback and W. D. Paist (to Celanese Corp. of America). U. S. 2,432,521, Dec. 16. Shaped articles of cellulose organic acid esters are rendered resistant to actinic light rays by introducing an aryl ester of salicylic acid into the surfaces thereof.

COATED CELLULOSIC SHEETS. G. Pitzl (to E. I. du Pont de Nemours & Co., Inc.). U. S. 2,432,542, Dec. 16. Applying a partially polymerized hydrophobic melamine-formaldehyde resin dispersed in a medium comprising a non-basic, water-soluble alcohol and at least 40% of hydroxyacetic acid to the base sheet.

RESORCINOL RESINS. P. H. Rhodes (to Koppers Co., Inc.). U. S. 2,432,544, Dec. 16. A fusible thermoplastic composite resin containing 5 to 80% of an aromatic amine-aldehyde resin, the balance of said resin being a fusible resorcinol-aldehyde resin.

RESINS. R. W. Quarles (to Carbide and Carbon Chemicals Corp.). U. S. 2,432,586, Dec. 16. A ketone-soluble resinous ester-amide of a dicarboxylic acid and an aryl secondary monoalkylolamine as a heat stabilizer for a chlorine-containing resin.

POLYMERS. R. H. Wiley (to E. I. du Pont de Nemours & Co., Inc.). U. S. 2,432,601, Dec. 16. An interpolymer of a vinylidene compound containing a carboxylic ester group with from 0.1 to 5% of a monomeric 2-vinyl substituted 1,3-dioxacyloalkane of 5 to 6 annular atoms, said vinyl substituted compound having 5 to 16 carbons, is hydrocarbon except for the two oxa oxygens and has the unsaturation of the vinyl group as its only acyclic unsaturation.

ENAMEL. H. J. Kauth (to General Cable Corp.). U. S. 2,432,623, Dec. 16. A wire enamel having a furan resin base and containing a polyvinyl acetal as a flexibilizing agent.

FLEXIBLE COVER. C. E. Gardner (to Gardner Associates, Inc.). U. S. 2,432,662, Dec. 16. An article cover comprising a body of flexible sheet material having a head section provided with a reversely turned part affording a stretchable neck portion, both sections being made of a thermoplastic film material.

SILICON POLYMERS. J. F. Hyde (to Corning Glass Works). U. S. 2,432,665, Dec. 16. An organo-polysiloxane consisting essentially of recurring phenylalkylsiloxane units.

OPTICAL ELEMENTS. A. W. Kingston. U. S. 2,432,668, Dec. 16. A process for preparing optically polished surfaces from transparent thermoplastic material.

RESINS. A. K. Scribner and F. W. Wilder (to Phillips Petroleum Co.). U. S. 2,432,686, Dec. 16. Reacting a mixture containing 42 to 58% propylene, 28 to 39% butene-2, and 14 to 19% butene-1 with sulfur dioxide.

WALL TILE. E. R. Gilbert (to E. I. du Pont de Nemours & Co., Inc.). U. S. 2,432,747, Dec. 16. An imitation of ceramic tile comprising a pressed wood fiber board base

MOTOROLA *needed:*

2-Piece Radio Phonograph Cabinets— In Quantity In a Hurry

GENERAL AMERICAN *delivered!*

Motorola needed quick delivery of two-piece plastic cabinets to keep up with the increased production of their fast-selling radio phonograph combinations.

To start the job, General American supervised the manufacture of the dies. These dies were especially designed for faster production than had previously been possible. Holes were cored to do away with slow drilling. Because of the extremely high gloss finish on all parts produced by General American, time-consuming buffing and polishing were eliminated. From one set of dies General American was quickly delivering more than enough cabinets to keep pace with Motorola's production.

Facts About This Job:

- Cabinet Lid produced on 350 ton press
- Base produced on 500 ton press for efficiency and lower cost
- To guarantee precision accuracy and close tolerances, General American designed a special shrink fixture
- General American handled all secondary operations
- Material used was walnut phenolic plastic

This same kind of specialized plastics service is available to you. General American designers and engineers will plan your part or product for maximum efficiency and sales appeal. Your plastics will be produced by General American's modern die-making equipment and high-speed molding machines (2 to 32 oz. injection presses and 100 to 2000 ton compression presses) *on schedule.*

Write or send blueprint for quotation and suggestions, at no obligation.

PLASTICS DIVISION

PLASTICS DIVISION GENERAL AMERICAN TRADE MARK

GENERAL AMERICAN TRANSPORTATION CORPORATION

135 South LaSalle Street
Chicago 90, Illinois

New York
10 East 47th Street

Los Angeles
Richfield Building

which has had applied thereto some plastic coating compositions.

LAMINATED SHEET. H. C. Gray (to Continental Can Co., Inc.). U. S. 2,432,752, Dec. 16. A method of forming laminated resin-impregnated stock sheets.

CONDENSATE. O. Albrecht (to Soc. Chemical Industry in Basle). U. S. 2,432,850, Dec. 16. Condensing an aliphatic or aromatic amide with an aldehyde sulfoxylic acid.

PLASTIC RING. G. J. Evalt. U. S. 2,432,870, Dec. 16. A method of constructing permanently closed plastic loops.

FURAN RESINS. H. I. Hersh (to Owens-Illinois Glass Co.). U. S. 2,432,890, Dec. 16. A resin produced by reacting furfuryl alcohol with a dicarboxylic acid combined with woodflour, carbon black, and zinc stearate on rolls.

SILICON RESIN. L. R. B. Hervey (to A. D. Little, Inc.). U. S. 2,432,891, Dec. 16. Preparation of a stable silicon-containing polycondensate.

POROUS COMPOSITION. K. S. Rutman and J. R. Parsons (to U. S. Gypsum Co.). U. S. 2,432,971, Dec. 16. A porous fibrous, cementitious composition consisting of calcium sulfate or portland cement, a fibrous material, and methyl cellulose.

ZEIN SOLUTIONS. R. E. Coleman (to Time, Inc.). U. S. 2,433,029, Dec. 23. A method of preparing a zein-containing solution containing 5% or more of water.

OLEFIN POLYMERS. J. P. Hamilton (to Carbide and Carbon Chemicals Corp.). U. S. 2,433,045, Dec. 23. Continuous gas phase polymerization of olefins to solid polymers under pressures exceeding 500 atmospheres and at temperatures above 100° C.

PHOTOPOLYMERIZATION. R. F. Hayes (to Monsanto Chemical Co.). U. S. 2,433,047, Dec. 23. Polymerizing under the influence of ultra-violet light a polymerizable vinylidene compound admixed with 0.1 to 5.0% of 2,7-dichlorodiphenylene sulfone.

LACQUERS. E. C. Pfeffer, Jr. and F. M. deBeers, Jr. (to Continental Can Co., Inc.). U. S. 2,433,062, Dec. 23. A coating composition comprising a thermosetting phenol-aldehyde resin and polymers or copolymers of vinyl halide and vinyl acetate, together with an acid-catalyzed permanently-fusible phenol-aldehyde resin for effecting compatibility between the vinyl polymer and the thermosetting phenolic resin.

IGNITION HARNESS. H. M. Wilkoff. U. S. 2,433,081, Dec. 23. An ignition harness for internal combustion engines which includes a flexible core tube of synthetic resin and a seamless flexible insulating jacket.

POLYVINYL ACETALS. M. O. Debacher (to Monsanto Chemical Co.). U. S. 2,433,097-8, Dec. 23. A polyvinyl acetal resin containing 30% acetal groups and 50% hydroxyl groups and a partial ester of glycerol and an unsaturated aliphatic carboxylic acid containing at least 10 carbon atoms, or phenol-aldehyde reaction products or reaction products of aldehydes with substances containing two aldehyde-reactive hydrogen atoms attached to nitrogen.

MOLD COMPOSITIONS. H. Staeger (to Gesellschaft zur Forderung der Forschung auf dem Gebiete der technischen Physik an der Eidg. Technischen Hochschule G.T.P.). U. S. 2,433,168, Dec. 23. A molding composition capable of setting in the cold and especially suitable for use in casting metals, comprising admixing a major portion of sand with 1 to 6% of a binder containing a melamine-formaldehyde condensate and a portion of urea-formaldehyde and a weak acid hardening agent.

CLOTHESPIN. J. B. Tegarty. U. S. 2,433,171, Dec. 23. A unitary clothespin of molded plastic material.

ICE CUBE TRAY. J. A. Gits (to Jules P. Gits). U. S. 2,433,210-1, Dec. 23. A freezing tray comprising compartments of a thermoplastic material such as polyethylene.

ELECTRODE. W. W. Gleave (to Imperial Chemical Industries, Ltd.). U. S. 2,433,212, Dec. 23. An electrode for use in an electrolysis cell formed by impregnating a porous carbon with a polymer of a lower alkyl ester of acrylic, methacrylic, or chloroacrylic acid which has been polymerized in situ.

COATING. T. R. Springett (to Parke, Davis, and Co.). U. S. 2,433,244, Dec. 23. Enteric coating for substances to be ingested, comprising a film of a cellulose ester derivative containing free carboxyl groups incorporated in a resinous carrier, said film being insoluble in the stomach, but soluble in the intestines.

CERAMIC COATINGS. E. R. Box and F. E. Kerridge (to Johnson, Mathey and Co., Ltd.). U. S. 2,433,259, Dec. 23. Cellulose acetate or nitrate film is used to transfer to a ceramic a design which will not burn on firing.

ARTIFICIAL EYE. A. J. Brent, U. S. 2,433,261, Dec. 23. An artificial eye formed in layers of thermoplastic material.

FABRIC COATING. I. Y. Goldman. U. S. 2,433,270, Dec. 23. Kneading plastic material into a fabric and scraping off excess plastic before cure occurs.

RESIN BRISTLES. C. E. Slaughter (to Extruded Plastics, Inc.). U. S. 2,433,325, Dec. 23. A stiff, smooth-walled thermoplastic filament having in cross-section a thin wall encompassing a capillary channel open along the side.

RUBBER TO METAL BONDING. C. S. Fuller (to Bell Telephone Laboratories, Inc.). U. S. 2,433,357, Dec. 30. A metal base having a baked coating of a drying-oil-modified glycerol phthalate which has vulcanized thereto by means of benzoyl peroxide a body of a polyisopropylene ethylene sebacate maleate elastomer.

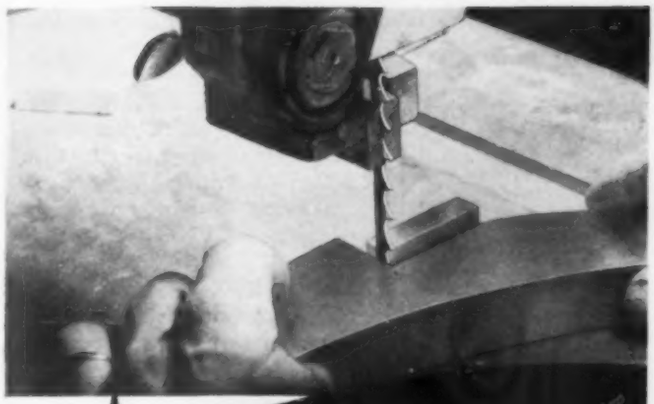
LACQUER. O. Saslaw (to Federal Telephone and Radio Corp.). U. S. 2,433,402, Dec. 30. A selenium cell having a coating comprising cellulose acetate, ethylene glycol monomethyl ether acetate and selenium dioxide.

COSMETIC DISPENSER. C. L. Wentworth. U. S. 2,433,587, Dec. 30. A plastic dispensing container for cosmetic material.

DIALLYL ESTER POLYMERS. K. E. Marple and E. C. Shokal (to Shell Development Co.). U. S. 2,433,616, Dec. 30. Avoiding discoloration of diallyl phthalate resin by

ATKINS

"Curled-Chip" Buttress Bands



CURL ONE—SKIP ONE FOR COOLER, FASTER PLASTIC SAWING

Faster feed without burning—smoother, cleaner cuts...add them up and they equal increased cutting output, lower cutting costs. These benefits are yours when you use Atkins "Curled-Chip" Band Saws with the Atkins-originated "Skip-Tooth" design.

"Curled-Chip" teeth bite deeply and easily *raising* and *lifting* the chip with a minimum of heat and friction. With fewer teeth per inch, there is extra gullet capacity for quick removal of material. The result is finer, glossier cuts, less refinishing, lower scrap losses, bands that last much longer. Whether your special interest is profile, contour, curved or cut-off sawing, Atkins offers you definite advantages. Write for full details today.

ATKINS
"ATKINS ALWAYS AHEAD"

E. C. ATKINS AND COMPANY
402 South Illinois Street
Indianapolis 9, Indiana
Agents and Dealers in Principal Cities the World Over

Have You Considered

Low Cost

REWORKED

Cellulose Acetate Molding Powders

✓

Bright and dark opaque colors

✓

Transparent amber, ruby, etc.

✓

Black

✓

ANY FLOW—UNIFORM THROUGHOUT

Available in any quantity for prompt shipment

We also offer other thermoplastic materials—reprocessed as well as virgin . . . If you wish to re-use your own scrap we can grind, magnetize, separate and rework it and return it to you clean and ready for use . . . On the other hand, we will buy your thermoplastic scrap, rejected molded pieces and obsolete molding powder.

It Will Pay You To Consult Us.

CELLULOSE ACETATE • POLYSTYRENE • METHYL METHACRYLATE

A. BAMBERGER
CORPORATION
44 HEWES STREET, BROOKLYN 11, N. Y.
PHONE: ULSTER 5-3887 • CABLE: CHEMPROD BROOKLYN

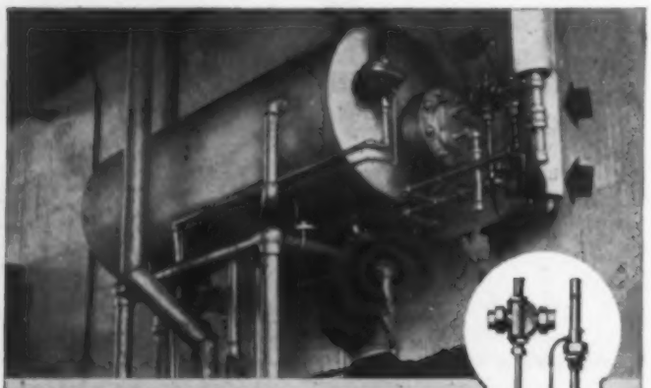
CELLULOSE ACETO · BUTYRATE • POLYVINYL RESINS, ETC.

THE CARVER LABORATORY PRESS

Standard for Research and Development

No research laboratory should be without this small, accurate general utility Press. The Carver Laboratory Press is standard for development, research and instruction work, testing single cavity molds, pressing tests, preparation of samples and even for small scale production. Controlled pressures to 20,000 lbs. Self-contained, hydraulic unit with 6" gauge rigidly mounted on base. Carver Standard Accessories include Electric or Steam Hot Plates, Carver Test Cylinders, Swivel Bearing Plates, Cage Equipment, etc. Send for catalog.

FRED S. CARVER INC.
HYDRAULIC EQUIPMENT
343 HUDSON ST. NEW YORK 14, N. Y.



THE KEY TO SUCCESSFUL TEMPERATURE CONTROL

Thousands of dollars are involved in the difference between success and failure—of temperature control. In process work — a degree or two difference means rejects. Failure means lost production. In hot water service — it's fuel economy and reliability that count most.

The Sarco TR-21 is self operated with a thermostatic element of the liquid expansion type. No stuffing boxes.

This regulator has been outstandingly successful since 1912. Ask for Bulletin No. 600.

19

SARCO SAVES STEAM

SARCO COMPANY, INC.
475 Fifth Avenue, New York 17, N. Y.
SARCO CANADA LTD. 85 Richmond St. W. TORONTO 1, ONT.

effecting polymerization in the presence of 0.5 to 1.0% of methyl iodide.

POSTFORMING PHENOLIC SHEET. W. I. Beach, R. L. Whann, and A. S. Peterson (to North American Aviation, Inc.). U. S. 2,433,643, Dec. 30. Heating a C-stage thermosetting-resin-impregnated fabric sheet for not more than 3 min. at 300° F. so as to impart forming flexibility, shaping, and permitting to cool.

POLYLACTYLIC ACID. P. D. Watson (to U. S. A.). U. S. 2,433,721, Dec. 30. Resinous material prepared by polymerizing polylactylic acids, fatty drying oils, fumaric acid or maleic anhydride or mixtures thereof, and an unmodified oil-soluble alkyl phenol-formaldehyde resin or an unmodified oil-soluble aryl phenol-formaldehyde resin.

THERMOPLASTIC. O. M. Arnold. U. S. 2,433,727, Dec. 30. The method of molding thermoplastics comprising extruding and stretching to form a fiber, applying a plasticizer to the exterior thereof and compressing a mass of the resulting treated fiber at a temperature sufficient to unite said fibers into a solid body.

RESIN TREATMENT. L. Auer, U. S. 2,433,832-3, Jan. 6. A rosin-base varnish resin is modified by subjecting said resin to the action of an aromatic di-primary amine with heat between 100 and 350° C. for at least 1 hour.

CORK SUBSTITUTE. E. C. Lathrop and S. I. Aronovsky (to United States of America) U. S. 2,433,849, Jan. 6. A cork substitute is prepared by dispersing gelatin in water at a temperature of 60 to 65° C. to produce a fluid medium, mixing paraffin, glycerol, glycose syrup, minute cellular particles of comminuted, pithy, natural cellulosic material, and saponin therewith, agitating to produce uniformity and entrap gas cells, adding formalin, forming the resultant mixture when partially set into a body of the desired shape in which the particles of peanut shells and the entrapped gas cells are separated by thick elastic portions of the body matrix.

PUTTY COMPOSITION. C. W. Johnson (to E. I. du Pont de Nemours & Co., Inc.). U. S. 2,433,910. Jan. 6. A putty comprising a polymerized ester of methacrylic acid and a filler such as colloidal china clay or talc.

EXTRUDING MACHINE. H. T. Tornberg (to Modern Plastic Machinery Corp.). U. S. 2,433,936-7, Jan. 6. Modified form of cylinder and die for a plastic extruder.

FLUORESCENT-DYED FABRIC. G. C. Ward and V. S. Salvin (to Celanese Corp. of America). U. S. 2,433,939, Jan. 6. Cellulose acetate fabrics which fluoresce under excitation of ultra-violet light and which are fast to washing.

LAMINATED BOARD. C. A. Upson (to Upson Co.). U. S. 2,433,965, Jan. 6. The continuous process of making a laminated board from a series of sheets of paper-like fibrous material which includes impregnating and curing operations.

MODIFIED POLYMERS. M. J. Roedel (to E. I. du Pont de Nemours & Co., Inc.). U. S. 2,434,054, Jan. 6. A process comprising polymerizing vinyl acetate in the presence of a peroxy catalyst and approximately 2% by weight of lauryl mercaptan.

(*Please turn to next page*)

This little mark MPM on the Market...

means skill and economy in molding • deliveries on schedule • and quality worthy of your product's reputation . . . That is why so many manufacturers of nationally advertised products entrust their plastics molding requirements with MPM.

From a long background of broad experience has come a phenomenal performance record that establishes Minneapolis Plastic Molders as one of the outstanding molding organizations in the nation. The plastic parts for the new Toastmaster Toaster are typical of the MPM knack to handle knotty problems—often when others have failed—and deliver, with molding skill and maximum production economies. What has been done for others can be done for you. And although vastly expanded production facilities often operate near capacity, Minneapolis Plastic Molders are interested in any assignment, no matter how difficult or exacting, that can be accommodated.

SINGLE RESPONSIBILITY BECAUSE MPM FACILITIES ARE COMPLETE

From plan stage to finished product with MPM you gain the advantage of centralized responsibility . . . .

- INDUSTRIAL DESIGN
- MOLD AND DIE MAKING
- HOBS AND HOBBING
- COMPRESSION, TRANSFER INJECTION MOLDING

MINNEAPOLIS PLASTIC MOLDERS, INC.

4411 HIAWATHA AVE. • MINNEAPOLIS 6, MINN.

Affiliated with Pat Tool Co.

IMPREGNATION OF CELLULOSIC MATERIAL. W. E. Flood and E. Kosinszki (to Catalin Corp. of America). U. S. 2,434,106, Jan. 6. Cellulosic material is impregnated by applying thereto styrene monomer and an inert volatile liquid which is a solvent therefor, warming to polymerization temperature and evaporating the solvent.

INTERPOLYMERS. D. D. Coffman (to E. I. du Pont de Nemours and Co., Inc.). U. S. 2,434,145, Jan. 6. A glycolic ether of a hydrolyzed interpolymer of ethylene and vinyl acetate.

PENTAERYTHRITOL ROSINATE POLYMERS. W. Krumbhaar. U. S. 2,434,168, Jan. 6. The condensation and polymerization product formed at a temperature of 250 to 300° C. of a hydroxy ester of rosin acid with a pentaerythritol group polyhydric alcohol being employed as the sole essential reactant.

INTERPOLYMER. W. H. Sharkey (to E. I. du Pont de Nemours and Co., Inc.). U. S. 2,434,179, Jan. 6. A water-soluble hydroxyalkyl ether of a hydrolyzed interpolymer of ethylene and vinyl acetate is prepared by replacing at least 50% of the acetate groups of the interpolymer by glycol or substituted glycol ethers.

CAST VINYL RESINS. A. J. Seitz (to Wingfoot Corp.). U. S. 2,434,231, Jan. 6. A process for preparing cast film, sheeting, etc., from vinyl resins.

NYLON. J. R. Lewis, D. McCreath, and R. J. W. Reynolds (to Imperial Chemical Industries, Ltd.). U. S. 2,434,247, Jan. 13. Elastic nylon articles are obtained by heating undrawn nylon in filament or film state with an acidic catalyst vapor phase monohydric alcohol, and vapor phase formaldehyde at 80 to 150° C. until the nylon has gained 4% by weight of combined formaldehyde.

ARTIFICIAL TEETH. J. Kohn and M. R. Stein (to Universal Dental Co.). U. S. 2,434,416, Jan. 13. Artificial teeth are prepared by molding from opaque and translucent thermoplastic material.

LIGHT STABLE COMPOSITION. T. Houtman, Jr. (to Dow Chemical Co.). U. S. 2,434,496, Jan. 13. A composition comprising a polymer in which at least one polymerized ingredient present in excess of 10% comprises vinylidene chloride or vinyl chloride and a diphenyl ketone derivative.

IMITATION FABRIC. H. Wurzburger (to P. D. Wurtzburger). U. S. 2,434,532, Jan. 13. A flexible unwoven fabric formed integrally in situ, simulating a fabric made of distinct filaments and composed of organic plasti material.

IMITATION FILAMENTS. H. Wurzburger (to P. D. Wurzburger). U. S. 2,434,533, Jan. 13. A single filament of synthetic organic plastic having a helical groove formed in its outer surface and extending continuously from end to end of said filament with a predetermined pitch and a plurality of longitudinally extending grooves formed in said filament, said grooves serving to impart flexibility to the filament in use and at the same time serving to simulate a rope.

RADIO-FREQUENCY BONDING. J. W. Mann and G. F. Russell. U. S. 2,434,573, Jan. 13. Adhesives between sections of materials to be bonded are cured by the penetration of radio frequency lines of force.

Making Records!

These Aldrich Inverted Triplex Pumps are setting performance records as they help make phonograph records in the plant of a large eastern manufacturer. For over a year, this battery of three pumps has operated 24 hours a day, 7 days a week—dependably and efficiently.

The pumps are constant stroke type, are fitted with Aldrich synchronized suction valve control and have 200 HP, 200 RPM engine type synchronous motors mounted directly on the crankshaft. The installation is unique in that the pumps and motors operate at the same speed.

In still another installation, where pumping requirements are not as great, Aldrich-Groff "POWR-SAVR" Variable Stroke Pumps are being used to perform a similar service. With these pumps, the stroke can be automatically regulated to deliver desired capacity while maintaining uniform pressure in the hydraulic system to within 3% variation.

So, whether your job involves record pressing, plastic molding or die casting, one of the high pressure pumps offered by Aldrich should be able to meet your requirements. For information write to:

THE ALDRICH PUMP CO., 6 GORDON STREET, ALLENTOWN, PA.

ALDRICH — THE *First* NAME IN INVERTED RECIPROCATING PUMPS

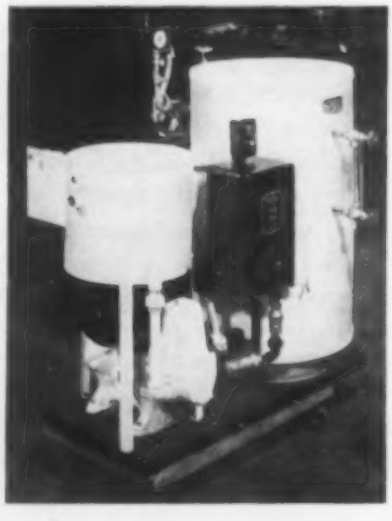
Representatives: Birmingham • Bolivar, N. Y. • Boston • Chicago • Cincinnati • Cleveland • Denver • Detroit Duluth • Houston • Jacksonville • Los Angeles • New York • Omaha • Philadelphia • Pittsburgh • Portland, Ore. • Richmond, Va. • St. Louis • San Francisco • Seattle • Spokane, Wash. • Syracuse • Tulsa

NEW MACHINERY AND EQUIPMENT

Heating unit—Industrial Radiant Heat Corp., Gladstone, N. J., is now offering the Delt Calesco super heating unit capable of developing a temperature of 550° F. ±2% on the surface and 480° F. ±2% 1 in. from the surface. Units built to operate at 900° F. may be obtained by special order. The new super heating unit consumes approximately 6 watts per sq. in. and measures from 12 to 144 in. long, from 4 to 42 in. wide, 5½ in. thick and has an over-all surface of from 1 sq. ft. to 42 sq. feet. It is controlled by a percentage timer, a variable transformer, and a rheostat.

Hydraulic press—For any operation that may require heat and pressure up to 20 tons, Preco, Inc., 1102 Architects Bldg., Los Angeles 13, Calif., is offering PA7, a new bench-type hydraulic press 32-in. high. It may be used individually or in batteries with its built-in hand pump, or connected to a central hydraulic system. Electrically heated, water-cooled platens which open from 0 to 8 in. are standard. Platen sizes of 8 by 8 in. or 8¾ by 12 in. are available. Platens for heating from a central steam plant, solid platens for cold work, and a third platen for installation between the two standard platens, are obtainable.

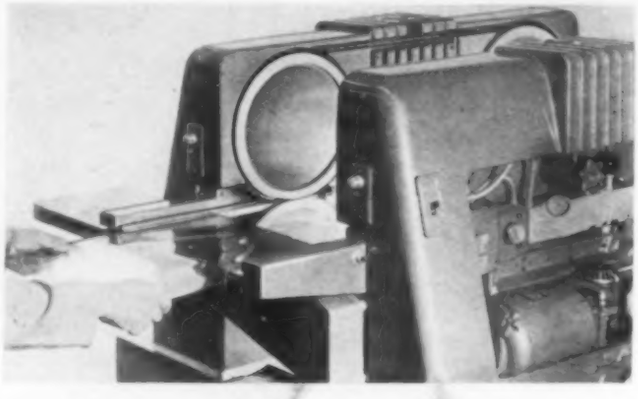
Automatic, electric steam generator—An electric steam generator for use in plastics molding plants, laboratories, cleaning and dyeing establishments, dairies, etc., has been announced by Custom Engineering Co., 3138 W. Slauson Ave., Los Angeles 43, Calif. The elimination of vents, gas and oil lines, fuel storage, and handling problems, simplifies installation and operation, increases safety, and permits the use of the unit in heretofore unhandy or useless space. The generator is available in sizes from ½ to 25 boiler hp., is designed for operating pressures up to 150 p.s.i., and has a thermal efficiency of 98 percent. It steams in 10 to 13 min. and recovers 10 lb. of pressure in less than 15 seconds.



Scale problems have been practically eliminated as metal temperatures do not exceed the temperature of the surrounding water and steam; therefore, suspended solids have no hot surfaces on which to bake. Instead, they collect in the lower portion of the boiler and can be blown out at regular intervals.

The boiler proper is cylindrical; the top and bottom heads are semi-ellipsoidal in shape. Large handholes are included in top and side to facilitate cleaning and inspection. Tubular type, submerged heating elements are employed. Blown mica 3 in. in depth lines the walls of the unit and serves as insulation.

Edging and folding machine—Beading or folding one or both parallel edges of sheet plastic in like or different beads or folds is now possible with the introduction of the Duplex Edger, a combination edging and folding machine, by the Taber Instrument Corp., 136 Goundry St., North Tonawanda, N. Y. It can bead or fold 500 to

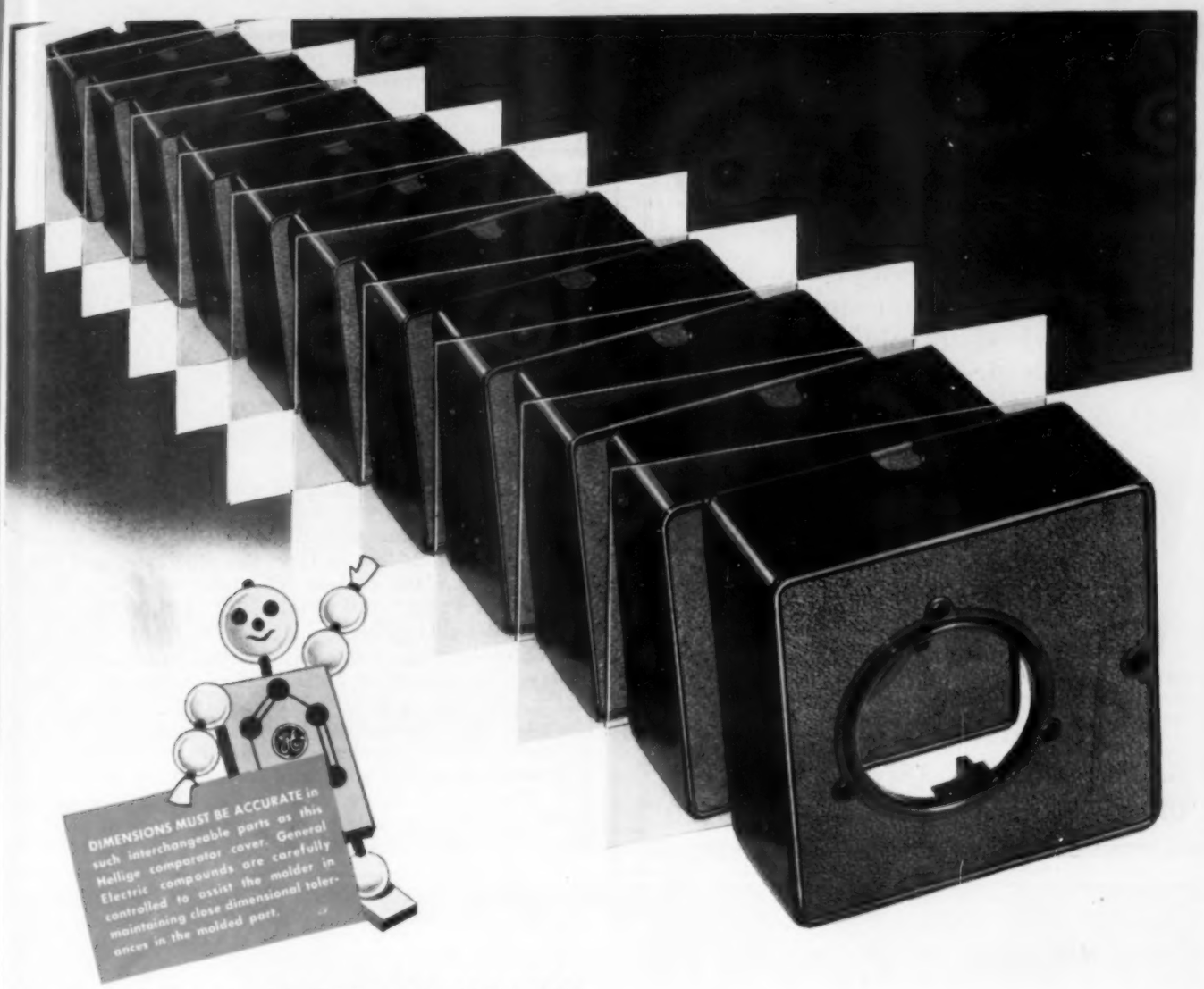


1000 in. of sheet plastic per min. ranging in gage from 0.005 to 0.020 in thickness, and from 2 to 20 in. in width. When roll material is used, operation of the machine is continuous and automatic; sheets or die cut or printed blanks are fed by hand. Electrically heated, thermostatically controlled dies for a variety of bead shapes are available. In the folding operation the continuous plastic web is preformed in a roller type guide before entering the edging machine where the heated dies form the fold and cool it.

Tapping machine—Cleveland Tapping Machine Co., Hartsville, Ohio, has added Model EO lead screw tapping machine to its line of high-speed production tapping machines. It will tap single holes up to ½-in. National Course Thread in mild steel or, using multiple heads, as many as eight No. 6-32 or four ¼-in. holes. Reversal capacity is 1650 strokes per hour. Tapping depth is controlled to within 0.005 inch. This machine may be operated manually or automatically; where work lends itself, indexing feeds, cross slides, and hopper feed may be combined with automatic cycling to provide complete automatic operation.

Rustproof coating—Kano Rustproof, a clear, hard, dry rustproof coating which can be applied to metal surfaces cold by dipping, spraying or brushing, has been developed by Kano Laboratories, 75 E. Wacker Drive, Chicago 1, Ill. It dries in about 15 min. and is said to have the ability to creep under and displace moisture, finger prints, etc., thereby avoiding spotty rust on polished surfaces due to handling. It is recommended for use on hand tools, molds, raw stocks, and finished parts. According to the company, it will protect surfaces under ordinary indoor conditions for periods up to six months and more. The coating may be removed with any petroleum solvent, but this is not necessary prior to painting.

(Please turn to next page)



DEPEND ON G-E MOLDING COMPOUNDS

TO MAINTAIN CLOSE DIMENSIONAL TOLERANCES

You can depend on General Electric molding compounds to give you constant physical properties plus consistent molding behavior. This often means fewer rejects and lower production costs.

Quality Control Maintains Uniformity

Quality control, which starts when raw materials are received and is continued through every phase of manufacturing operations, assures uniform characteristics. Careful tests check for tensile strength . . . impact strength . . . dielectric strength . . . shrinkage . . . pourability . . . and all other critical properties that affect your molding operations. No batch of any General Electric compound leaves the plant until it has been thoroughly evaluated.

Choose from a Variety of Materials

You can have colors or mottled effects, phenolic or phenol-modified resins, and fillers of wood flour, cotton flock, fabric, or asbestos. If these standard stocks won't meet your needs, General Electric can custom-tailor a special compound to your exact requirements.

G-E Application Engineers Will Help You

Skilled G-E technicians stand ready to help with your molding problems. Don't hesitate to make use of their wide experience and extensive laboratory facilities. And ask to see a sample of the detailed data sheets furnished for every G-E compound. Just drop a line to *Section DX-5, Compound Division, Chemical Department, General Electric Company, Pittsfield, Mass*

GENERAL ELECTRIC

INJECTION MOLDING

We are equipped to accept jobs which require custom injection molding of thermoplastics. Prices reasonable, and work of the highest quality.

For further details and estimates, call or write:

WILLSON PRODUCTS, Inc.

PLASTIC SALES DEPT.

READING, PA.

Est. 1870

DIAL 4-1161 • EXTENSION #220

ORGANIC PEROXIDES

CATALYSTS FOR POLYMERIZATIONS
DRYING ACCELERATORS · OXIDATION AGENTS · BLEACHING AGENTS

LUCIDOL* (BENZOYL PEROXIDE) LUPERCO* (PEROXIDE COMPOUNDS)

ALPEROX* C (TECHNICAL LAUROYL PEROXIDE)

LUPEROX* (PEROXIDE PASTES) LUPERSOL* (PEROXIDE SOLUTIONS)

Special Organic Peroxides

*REGISTERED TRADEMARK

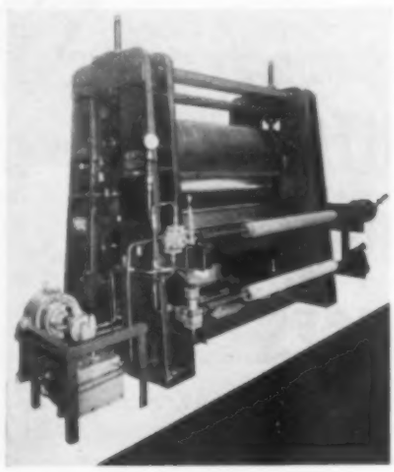
TRADE MARK

LUCIDOL DIVISION

NOVADEL-AGENE CORPORATION
BUFFALO 5, NEW YORK

Masks for spray painting nameplates, hub caps, horn buttons, dials, etc.—Spray painting of sunken or raised areas of metal or plastic parts has been simplified with the introduction of a new form-fitting electro-formed metal masking template by the Conforming Matrix Corp., 364 Toledo Factories Bldg., Toledo 2, Ohio. Enamels, one color after another, can be wet painted before baking on convex, concave, or irregularly shaped three-dimensional parts with these masks. The need for cleaning after painting as well as the costly procedure of making the masks by hand have been eliminated. Three general types of these masks are offered: the lip type, the plug type, and the block cut-out plane surface type (shown above). The lip type has a thin lip of metal which fits into the edge of the debossed areas receiving the paint, traps the paint, eliminates fogging at the edge of the paint line, and avoids after-wiping or buffing off of overspray. Plug masks are used on plastics where side lighting is employed to illuminate clear depressed characters. They are also applicable to plastics molded in solid color, but to be decorated with additional colors on the face surface. The "loose" insides of letters and numerals, such as "0" and "6", are held in place on all types of masks by means of special arched bridging.

Hydraulic calender—Gadgene Machinery Co., Fifth Ave. and McLean Blvd., Paterson 4, N. J., has introduced a 60-in. heavy duty three roll hydraulic calender with pressures up to 80 tons. The unit has two 22-in. diameter paper rolls and one 12-in. diameter steel roll. A patented equalizing arrangement keeps the rolls straight so they cannot wear to a taper. The speed of the machine is 70 yards. Other features include: 20 hp. motor with "V" belt drive to countershaft, take-up, and let-off; a hydraulic oil pressure arrangement including pump and motor; and all steel construction.

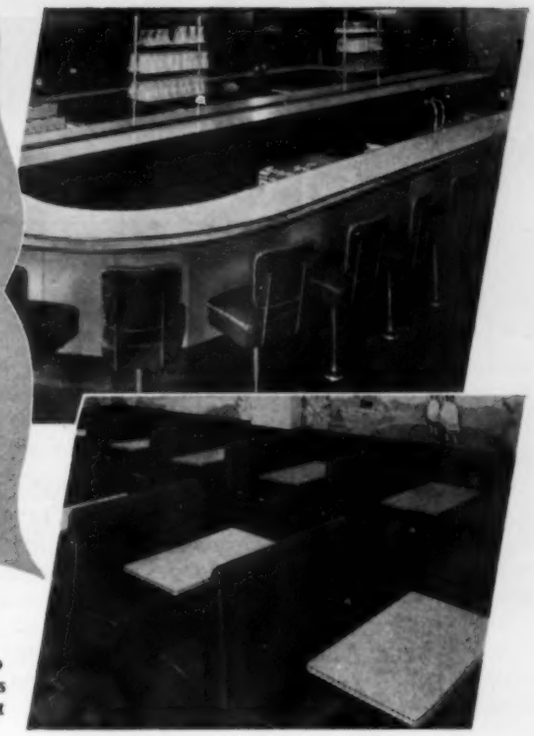


Contact wheel—Beltflex, a new contact wheel for abrasive belt polishing, has been introduced by Divine Brothers Co., 200 Seward Ave., Utica 1, N. Y. Designed to eliminate the necessity of using buff sections under abrasive belts, this wheel is said to have the advantages of the buff sections plus controlled balance and density, and a smoothly ground surface. Wheels are available in two degrees of density: E, offering great flexibility, and G, offering flexibility with aggressive cutting action.

AVAILABLE IN 25 PASTEL SHADES

FARLITE

FOR MODERN COLORFUL LAMINATED PLASTIC FOUNTAIN AND TABLE TOPS



Here's the good news you've been waiting for—because it's the way to add new appeal to fountain tops and refreshment booths. Pastel shades in blues, greens, reds, yellows, etc. offer you choice of a solid color that will harmonize with any color scheme.

In addition to solid colors, FARLITE is available in decorative designs of marble, wood grains, linen, etc. It is time-tested under most severe conditions. 5-ply, cross-banded construction. Edges trimmed with FARLITE or metal.

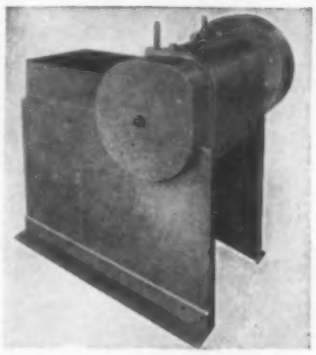
TOP *In Soda Fountains*—Sparkle and cleanliness radiate from FARLITE surfaced countertops and reflect the last word in business stimulating equipment.

BOTTOM *In Refreshment Booths*—These delightful FARLITE tops are modern and colorful. Hot or cold liquids hold no terrors for the stain-proof, easily cleaned surfaces.

Plastics Division •
FARLEY & LOETSCHER MFG. CO., Dubuque, Iowa

Cumberland Machines for the Plastics Industry

New!



CUMBERLAND ROTARY CHOPPING MACHINE

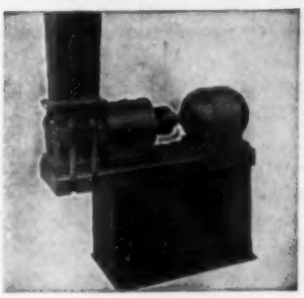
This cuts slab material from compounding mills, chops continuously extruded rods, sheets or strands, and cuts up calender roll side shear strips. This machine is also used in conjunction with extrusion machines to produce cube or pellet material suitable for a molding compound.

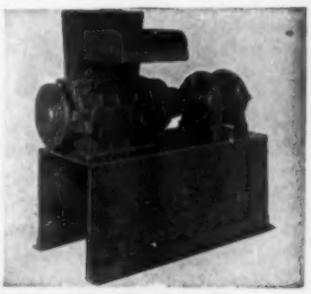
CUMBERLAND SLITTING & MANGLING MACHINE

This is useful primarily to manufacturers who compound plastic materials. The machine may be used to reduce material for use as a commercial product without further granulating. Or it may be used to prepare material for subsequent final reduction in a granulating machine.

CUMBERLAND PLASTICS GRANULATING MACHINES

These machines are designed especially for plastics. They perform with high efficiency the special cutting requirements of plastic materials. They are simple in design, rugged in construction and are easy to dismantle and clean. These machines are built in two styles. Nos. 0, ½ and 1½ as at top right (No. ½ is illustrated). Also, large 18" machine, double hung, with retractable knife block for complete accessibility. (Illustrated at right below.)





REQUEST CATALOGS

Plastics Granulating Machines.....No. 200
Slitting and Mangling Machine.....No. 300
Rotary Chopping Machine .....No. 400

CUMBERLAND ENGINEERING COMPANY, INC.
Dept. (A), Box 216, Providence, Rhode Island

BOOKS AND BOOKLETS

Write for these publications to the companies listed. Unless otherwise specified, they will be sent gratis to executives who request them on business stationery

"The Science of Plastics, Vol. 1," edited by H. Mark and E. S. Proskauer with the collaboration of P. M. Doty, F. J. Frillette, and B. H. Zimm.

Published by Interscience Publishers, Inc., 215 Fourth Ave., New York 3, N. Y., 1948. Price $9.00, 632 pages.

Based on the original literature for 1942-1946, this volume comprises a systematic collection of abstracts. It is designed as a source book for those interested in pursuing the progress of theory and experiment. Abstracts are grouped into chapters on properties and evaluation of plastics, physical chemistry of polymer systems, kinetics of polymerization reactions, and plastics engineering. Author index and subject index supplement the arrangement.

"Plastics in Practice," by John Sasso and M. A. Brown, Jr.

Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18, N. Y., 1948. Price $4.50, 185 pages.

Data are presented on the various types of plastics, methods of forming, comparative properties, and cost factors, together with case histories describing how plastics have been adopted to answer a series of specific problems. New developments in materials and processes are also covered.

"High Polymers: Vol. VI, Mechanical Behavior of High Polymers," by Turner Alfrey, Jr.

Published by Interscience Publishers, Inc., 215 Fourth Ave., New York 3, N. Y., 1948. Price $9.50, 581 pages.

A comprehensive analysis of the phenomenological behavior of high polymers in terms of their molecular structure. Polymers are discussed under the categories of amorphous linear polymers, cross-linked polymers, crystalline polymers and polymers admixed with components of low molecular weight. Fundamental principles underlying mechanical behavior are expounded and exemplified in numerous diagrams, graphs, and schematic drawings throughout the text. Data are supplemented by four appendices. Each of the six chapters is followed by a bibliography. An extensive subject index facilitates use of the book.

"Flame-Proofing Textile Fabrics," edited by Major Robert W. Little.

Published by Reinhold Publishing Corp., 330 W. 42nd St., New York 18, N. Y., 1947. Price $6.75, 410 pages.

This comprehensive survey, intended mainly for military usage and prepared by members of the National Research Council, National Academy of Arts, is divided into three general sections. These sections cover the fundamental mechanisms of thermal degradation of cellulose and the chemical or physical phenomena of flame-proofing; the methods employed in the processing and evaluation of flame-proofed fabrics; and the various applications for flame-retarding treatments of fabrics.

Black light—An illustrated pamphlet describing Vio-Glo—ultra-violet black light radiation and its fluorescent effects—has been published by Vio-Glo Plastics Corp., 479 Ave. of the Americas, New York 11, N. Y. It explains the ways in which Vio-Ray black light lamps can be used to create new effects in theater lobbies, restaurants, night clubs, in stores and shop windows as displays, in factories to prevent accidents, in printing, and on mural hangings, carpets, signs, and radio dials.

Company report—The Plastics Div., Monsanto Chemical Co., Springfield 2, Mass., has just released a 19-page booklet, entitled "What Monsanto Plastics Can Do For You." New information is presented on recent developments in raw materials as well as detailed summaries of all of the company's other plastics. The products are explained in terms of general physical properties, characteristics, fabricating methods, typical end uses, and the forms in which they are supplied.

Magnetic laboratory—Bulletin No. 1120, "Magnetic Analysis!," issued by the Dings Magnetic Separator Co., 4740 W. McGeogh Ave., Milwaukee 14, Wis., describes operation of the company's laboratory in solving separation problems peculiar to any industry.

Polishing and buffing cloths—Divine Brothers Co., 200 Seward Ave., Utica 1, N. Y., has released "Buff Cloth Bulletin—FDB-3," a catalog page, bearing 10 samples of cloth used for making buffs. The sheet has the actual material glued on it in such a manner that it can be readily examined. Beside each swatch is a brief description of the recommended use for that quality material.

Contact controller—Taylor Instrument Companies, P. O. Box 110, Rochester 1, N. Y., has just released Bulletin 98098, "Taylor Electric Contact Controller." This attractive four-page bulletin describes a new controller for on-off applications involving temperature, pressure, flow, liquid level, or humidity in ovens, vats, and tanks. Photographs, together with construction and application drawings, show how this controller can be applied to meet various industrial needs.

Short runs—A four-page booklet, "Short Runs of Injection Molded Plastics," has been prepared by the Kirk Molding Co., 104 Brook St., Clinton, Mass. It describes the value of pre-testing a finished plastic product under actual sales conditions—and deals with methods for doing so by taking advantage of the services offered by a short run shop. It tells how the product of a short run shop may be used as a tool for market research, and how it may aid technical research and development.

Designs needs for the American home—"Houses for Family Living," by Frederick Gutheim, a highly informative and well illustrated booklet presenting information recently acquired on family living and the home, has been published by The Woman's Foundation, Inc., 10 E. 40th St., New York 16, N. Y. The space requirements of a married couple in a home are discussed for four periods in their life. These periods are defined as: 1) the early years in which the young couple lives alone;

A BUYING GUIDE FOR ABRASIVES

ABRASIVE PROBLEM:
How can proper selection and application be assured?

ANSWER BY
CARBORUNDUM
TRADE MARK

To realize maximum efficiency from even the highest quality abrasives, it is essential that attention be directed to their correct use. For this specific purpose, The Carborundum Company has established a specialized group of product application engineers.

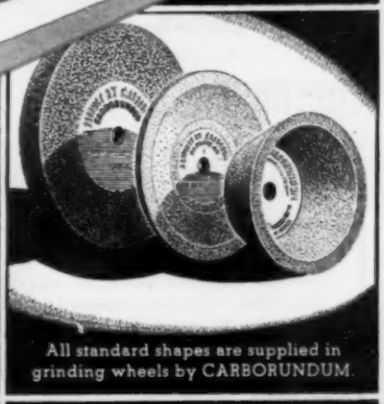
This group studies, appraises and tabulates abrasive applications. New improved methods and better abrasive products are often turned up. CARBORUNDUM engineers are also called in to help in selecting the best abrasives to use for specific jobs and in specifying their application. The end result is better grinding, sanding and finishing at lower overall cost . . . another reason pointed to in preferring abrasives by CARBORUNDUM. The Carborundum Company, Niagara Falls, New York.

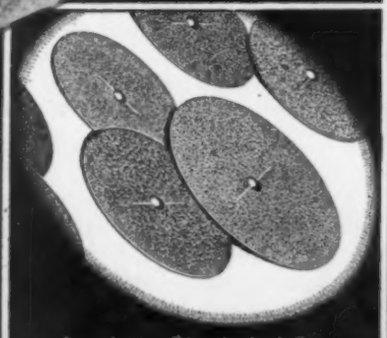
A Good Rule for Good Grinding...CALL IN

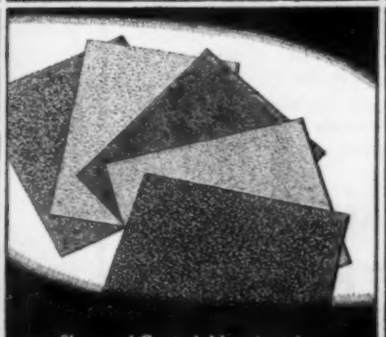
CARBORUNDUM
TRADE MARK

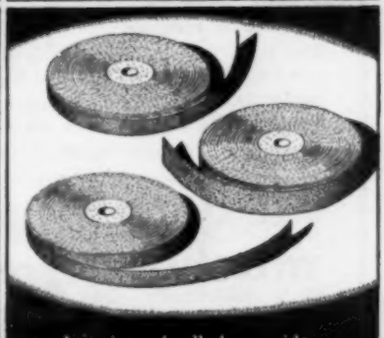
- BONDED ABRASIVES
- COATED ABRASIVES
- ABRASIVE GRAINS AND FINISHING COMPOUNDS


A Coated Abrasive for every sanding and finishing condition.


All standard shapes are supplied in grinding wheels by CARBORUNDUM.


Long lasting Discs for both flat and curved surfaces.


Sheets of Coated Abrasives for a variety of applications.


A variety of rolls for a wide range of uses.

"Carborundum" is a registered trademark which indicates manufacture by The Carborundum Company.

Cut TUMBLING COSTS THRU IMPROVED METHODS

Efficiency and economy in tumbling and other plastic finishing operations is a matter of adapting know-how and machinery to each particular problem. Joseph Lupo, president of the Lupomatic Tumbling Machine Corp. for 29 years, now puts his tremendous accumulation of knowledge at your disposal—to devise methods of doing your finishing faster, and at lower unit cost.

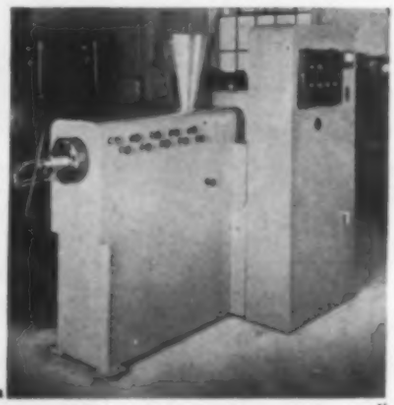
He'll speed up your tumbling, flash removal, polishing, burnishing, deburring and other finishing operations. He will design special equipment and formulate special polishing compounds to meet any unusual problems your job presents.

Take advantage of this chance to profit from Joseph Lupo's expert counsel. You will save money on your finishing operations by writing today.

LUPO RESEARCH LABORATORIES
3636 PARK AVENUE • NEW YORK 56, N. Y.
JErome 8-5310

MODEL #250
(2½" DIAMETER)

Modern Thermoplastic Extruder



Direct electrically heated for all temperatures to 600° F. Eleven separate jacketed zones for cooling by steam, oil, air, water. SIX-ZONE control instrument: four for electrically heated cylinder and two die zones with thermocouples.

SCREW speed indicator with relays, fuses, switches, etc., located in sturdy, well built control cabinet with large service door.

HOPPER, screw, liner, dieholder, strainer and dies of corrosion-resistant materials.

TEN H. P. Variable Speed Drive with oversize thrust capacity and enclosed herringbone gears, is among the other features.

INTERCHANGEABLE heads for wire covering, tubing, rods, strip, flat sheet and monofilaments are available.

Address your inquiries to W. T. Johnson

modern plastic machinery corp.

15 Union Street Lodi, New Jersey
Phone: Passaic 3-6218

2) the crowded years which last until the youngest child enters school; 3) the peak years during which the family income is at its highest, and 4) the later years when the children have left the home. The booklet costs 35¢.

Adhesives—Help in choosing the right adhesives, sealers, and coatings is offered in a 28-page booklet issued by the Minnesota Mining and Mfg. Co., 901 Fauquier Ave., St. Paul 6, Minn. Entitled, "3M Adhesives in Industry," the booklet contains 40 pictures, cites 18 case histories, and lists 26 of the more than 1000 formulas offered by the company. Bonding operations are also pictured.

Data on silicone rubber—A 16-page booklet, entitled "Silastic Facts No. 5," published by the Dow Corning Corp., Midland, Mich., describes the properties and uses of all the different commercially available types of Silastic, the Dow Corning silicone rubber.

Band saw—The Boice-Crane Co., 972 W. Central Ave., Toledo 6, Ohio has released a brochure describing its new 14-in. band saw. Facts are presented regarding the various models and their accessories. Colorful illustrations supplement the descriptions.

Gummed tape adhesive—"The Story of GP Adhesive," a 14-page booklet published by the Gummed Products Co., Troy, Ohio, describes and illustrates this adhesive for gummed tapes. The text also covers some of the basic principles of good gummed tape adhesion.

Laminates — The 1947 Edgar Marburg Lecture of the A.S.T.M., entitled "Engineering Laminates," has been issued by the Society as a 36-page booklet. The booklet presents a review of atomic structure and bonds, crystal lattices, and plastics. This discussion of chemistry, physics, and crystallography is followed by a section on adhesion. The published lecture includes 33 illustrations and several tables. Copies may be procured from A.S.T.M. headquarters, 1916 Race St., Philadelphia 3, Pa., at $1 per copy.

Fabricated plastics — The Fabri-Form Co., 114 Seneca St., Byesville, Ohio, has just released a new 12-page bulletin entitled "27 Ways to Use Fabricated Plastics." This bulletin presents the latest developments in plastics fabrication and shows interesting applications to many industrial, commercial, and consumer products. Attractive illustrations accompany the non-technical text.

Condensate return system—An illustrated 20-page bulletin, "Cochrane 'CBA' Condensate Return System," on high pressure condensate return systems has been announced by the Cochrane Corp., 17th St. & Allegheny Ave., Philadelphia 32, Pa. New technical material on turbulent vs. laminar steam flow and the effects of air and condensate films on heat exchange characteristics is presented. Also included is a description of improved equipment for the positive removal and drainage of condensates. Typical case histories are reported in detail.

Technical books—The Chemical Publishing Co., Inc., 26 Court St., Brooklyn 2, N. Y., has just issued its 1948 catalog of technical books on chemistry, physics, science, technology, petroleum, medicine, foods, drugs and cosmetics, engineering, building construction, etc. The catalog gives the date of publication of each book as well as price, number of pages, detailed description, and full table of contents.

HARFLEX*
PLASTICIZERS

DIBENZYL SEBACATE
DICAPRYL SEBACATE
DICAPRYL PHTHALATE
DIBUTYL SEBACATE

DIHEXYL SEBACATE
DIHEXYL PHTHALATE
DIMETHYL SEBACATE
BUTYL STEARATE

HARCHEM offers you a complete line of Plasticizers for Vinyl Resins, Synthetic Rubbers and other Plastics and Elastomers. HARCHEM has developed a variety of Plasticizers, each with its own special combination of properties. This enables the user to select that particular product most suited to his own needs. Consult us if you have a Plasticizer problem. Our technical staff will be glad to assist you.

HARCHEM

*Trade Mark

HARDESTY CHEMICAL CO., INC.
41 EAST 42nd ST., NEW YORK 17, N. Y.

"HOLD STILL PARDNER!"

(SO'S I CAN AIM)

Do like he says, Mister. He's just having fun . . . one of those lucky kids with a "Magic Bullet" gun. Quite a gun, too! It's plastic . . . in bright colors. The bullet comes out the end. (Doesn't leave the gun, though.) It's got a Super Site for long-distance work. And there's a whistle in the handle.

It also has our good name behind it: The Newark Die Company.

After the "Magic Bullet" was designed by the 20th Century Products Co. (New York), The Newark Die Company took over the problems of producing the master hob, hobbed cavities, and forces.

HOBBED CAVITIES

MASTER HOB

In our 25 years of serving the plastic industry, we've turned out thousands of compression, transfer, and injection type molds — *and to perfection.* That's why we're qualified to solve any multiple-cavity-mold problem you may have.

If you need our help (or just thinking), we'd like to talk with you.

Just tear out this coupon and mail to us.

(MP 5-48)

Please send me a free copy of "The Procedure of Die Hobbing."

Name..... Title.....

Company.....

Address.....

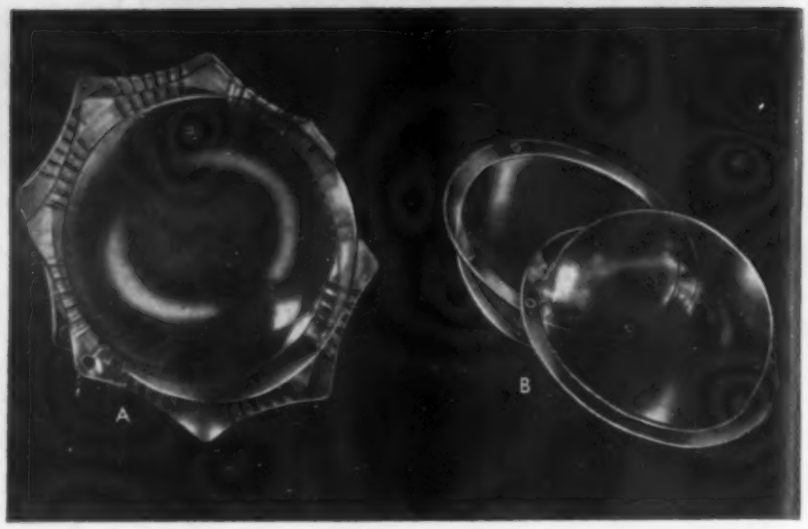
City..... State.....

NEWARK DIE COMPANY

22 SCOTT STREET NDC TRADE MARK NEWARK 2, N. J.

PLASTICS STOCK MOLDS*

May, 1948



A and B—Five and a half, and 4¼-in. drawn balls. Available in any size at a low die cost. Made from cellulose acetate sheet of thicknesses ranging from 0.010 to 0.020 in., depending on the size. Clear or assorted colors. Manufactured by Plaxall, Inc., 132-33 40th Rd., Flushing, N. Y.

C—Small crank handle, approx. 1 5/16 in. high, ¾-in. diameter base. Fabricated from cast phenolic rod stock. Drilled and counterbored to order. Assorted colors.

*Reg. U. S. Patent Office.

D—Small crank handle, approx. 1 15/16 in. high, ⅝-in. diameter base. Fabricated from cast phenolic rod stock. Drilled and counterbored to order. Assorted colors.

C and D manufactured by Keolyn Plastics, 2731 N. Pulaski Rd., Chicago 39, Ill.

E—Creamer, capacity 1 oz., weight 0.6 oz. Polystyrene. Antique ivory, white, blue, brown, china red, and pink marble. Loma Plastics, Inc., 1111 Foch St., Fort Worth 7, Texas, manufactures this creamer.

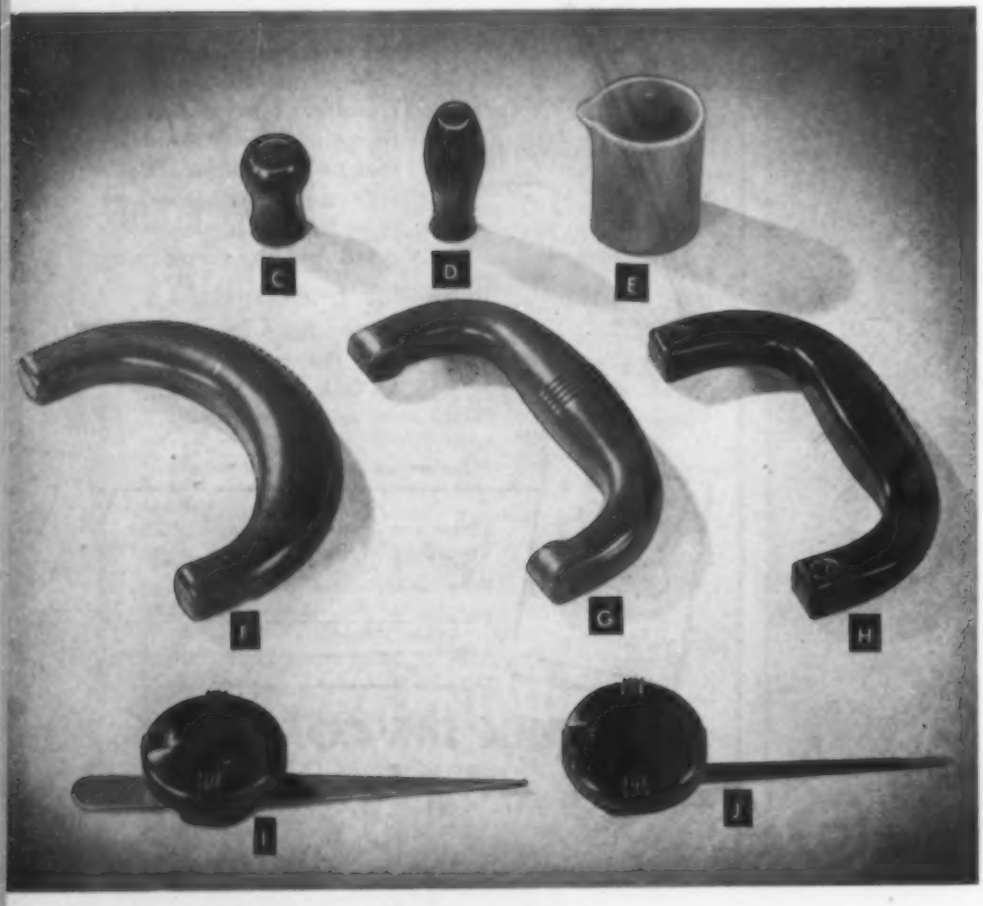
F—Simulated leather luggage handle, approx. 4½ in. long, 2 15/16 in. high. Fits all standard post holes. Phenolic. Molded in 16-cavity mold. Black, brown, ginger, green, mottled, mahogany, sun tan, luggage tan, and red.

G—Luggage handle, approx. 5 in. long, 2 5/16 in. high. Fits all standard post holes. Phenolic. Molded in 32-cavity mold. Black, brown, maroon, and green.

H—Luggage handle, approx. 4 13/16 in. long, 2 5/16 in. high. Fits all standard post holes. Phenolic. Standard colors.

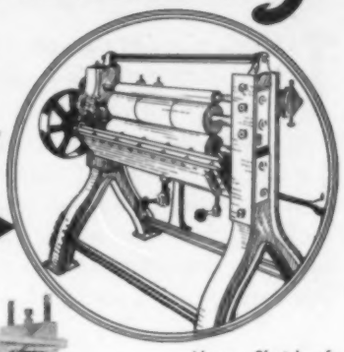
F to H incl. manufactured by I. Schwartzman & Son, 143-145 W. 29th St., New York 1, N. Y.

I and J—Instrument or panel knobs, 1 9/16-in. diameter with four equally spaced serrations. Approximately ⅞ in. high. Center hole can be any size up to ½ in., drilled and tapped for setscrews. Weight ½ ounce. Three location holes placed in triangular form around center hole. Can be furnished with pointer practically any shape and length. Thermoset. Black, brown, or assorted standard colors. These instrument or panel knobs are manufactured by Dimco Plastics, Inc., 207 E. Sixth St., Dayton 2, Ohio.



Plastics Treating

HAS COME A LONG WAY FROM THIS ➡



Above: Sketch of early treater head.

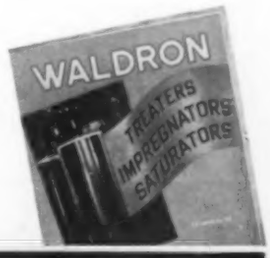
At Left: Latest type WALDRON Medium Duty Treater or Impregnator Head.

. . . thanks to modern WALDRON MACHINES for plastics conversion

In the modern process of treating a fibre mass such as paper or cloth with plastics in solution, the degree of accuracy and uniformity of the treatment or impregnation depends upon the design and construction of the treating mechanism. WALDRON machines with micrometer adjustment are designed to contend with the varying factors in webs and viscosities of solutions that are the chief causes of uneven caliper and finish of the treated sheet.

This modern WALDRON design also reduces to a minimum the amount and cost of solvents required by slower methods.

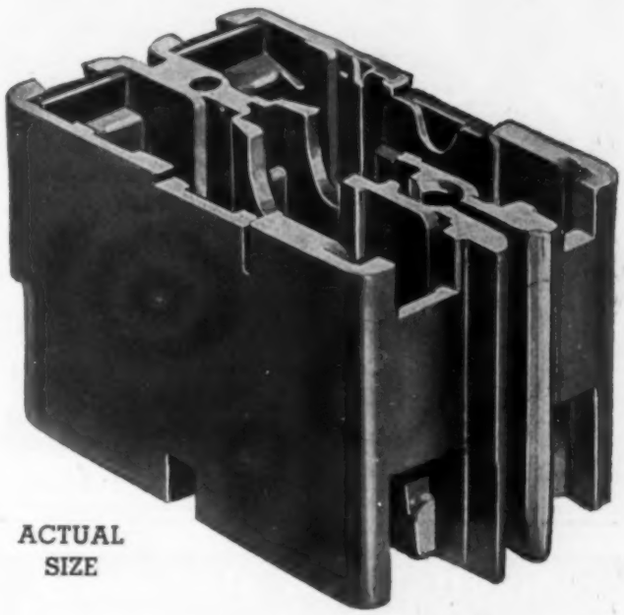
The book illustrated, Catalog 112 P, gives detailed description of mechanical features involved in treating goods with plastics materials. A copy will be sent upon request.



JOHN WALDRON CORP.
Main Office and Works
New Brunswick, New Jersey
MACHINES

KUHN & JACOB

are masters of detail in Plastic Molding



ACTUAL SIZE

Note the many planes and angles in the above piece, the smooth, perfectly molded surfaces. Knowledge and experience in selecting the material, expert skill in making the dies, and equal skill in molding result in a finished product like this.

ESTABLISHED 1919

TRY KUHN & JACOB NEXT

Kuhn & Jacob
MOLDING and TOOL CO.
1200 SOUTHARD STREET, TRENTON 8, N. J.
Telephone Trenton 4-5391

CONTACT THE **K & J** REPRESENTATIVE NEAREST YOU

S. C. Ullman, 55 W. 42nd St., New York, N.Y.
Telephone — Penn 6-0346

Wm. T. Wyler, Box 126, Stratford, Conn.
Telephone — Bridgeport 7-4293

AN ACE SPECIALTY!

PLASTIC BALLS
Fabricated in All Colors

Ace's modern, automatic equipment is geared to turn out fabricated plastic balls in all sizes (¼" to 1¾"), all materials, in a wide variety of colors. Ace also offers complete facilities for injection molding various special parts for all industries. Your blueprints or specifications will bring prompt estimates.

Let Our Engineers Advise You
Write today for color bulletin and samples.

Industrial Division
ACE PLASTIC COMPANY
Precision Molders and Fabricators
91-18 Van Wyck Blvd., Jamaica 1, N. Y.

THIS ELECTRONIC HEAT SEALER IS 60% FASTER

Because the press closes, its cycle is timed, and the press reopens — all automatically — the Progressive Electronic Heat Sealer can produce up to 60% more of a given item than any other bar sealer available. The operator merely places the plastic film in position and presses a button. While the "Progressive" works, the operator is free to ready the next unit for insertion.

The "Progressive" is available with a hinged press, as illustrated, or with an overhead press, in power output ranges from .25 KW to 2.5 KW. It comes complete with all necessary gauges and guards. Special larger units can be had up to 5 KW.

Our efficient field organization services your Progressive Sealer whenever necessary, wherever your plant is located—within 24 hours!
Write now—arrange for a free demonstration at no obligation to you.

Progressive Electronics Co. inc.
Bldg. #3 · 132 Eighth Street · Passaic, New Jersey

Consumption of

TOTAL plastics consumption in February was off about 8 percent. The decline was fairly general in all categories with molding materials and vinyl sheeting bearing the brunt of the loss. Part of the decline was due to the fewer working days in a short month, but there was a noticeable slack in molding plant operations during the month. For the first time in several months, phenolic molding powder consumption declined, lending point to the belief

PLASTICS AND SYNTHETIC RESIN CONSUMPTION
From Statistics Compiled by Bureau of

Materials
Cellulose acetate and mixed ester plastics[a]
Sheets
Continuous (under 0.003 gage)
Continuous (0.003 gage and upward)
All other sheets, rods, and tubes
Holding and extrusion materials
Total
Nitrocellulose plastics[a]
Sheets
Rods and tubes
Total
Other cellulose plastics[a, b]
Phenolic and other tar acid resins
Laminating (dry basis)
Adhesives (dry basis)
Molding materials[a]
All other, including casting (dry basis)[b]
Total
Urea and melamine resins
Adhesives (dry basis)
Textile and paper treating (dry basis)
All other, including laminating (dry basis)[b, c]
Total
Polystyrene[b, d]
Vinyl resins
Sheeting and film including safety glass sheeting[a]
Textile and paper coating resins (resin content)
Molding and extrusion materials (resin content)
All other including adhesives (resin content)[b]
Total
Miscellaneous resins
Molding materials[a, e]
All other (dry basis)[b, f]
Total
Grand Total

[a] Includes fillers, plasticizers, and extenders. [b] Excludes data for protective coating resins. [c] Excludes urea and melamine molding materials; see footnote [e]. [d] Dry basis, including necessary coloring material. Includes data for

Plastics Materials

held in some quarters that the saturation point has been reached in some items such as electric iron handles and possibly radio cabinets. Thermoplastic molding materials declined considerably with polystyrene dropping to its lowest point since September 1947. The bulk of the decline in vinyls was due largely to a slump in sheeting and film. Consumption data in this report is compiled from 83 firms reporting to the Census Bureau.

IN POUNDS FOR JAN. AND FEB. 1948
Census, Industry Division, Chemical Unit

January 1948	*February 1948*	*Total for first two months—1948*
lb.	*lb.*	*lb.*
365,984	486,811	852,795
654,362	534,599	1,189,449
264,850	299,727	564,577
4,460,908	3,733,443	8,194,351
5,746,104	5,154,580	10,900,684
582,594	658,059	1,240,653
282,795	271,822	554,617
865,389	929,881	1,795,270
746,816	651,637	1,398,453
3,389,537[r]	3,159,761	6,549,298
1,737,741[r]	1,790,826	3,528,567
18,338,089[r]	17,370,124	35,708,213
5,283,795[r]	4,379,839	9,663,634
28,749,162[r]	26,701,550	55,450,712
4,596,974	4,183,082	8,780,056
1,671,182[r]	1,955,332	3,626,514
555,516	633,709	1,189,225
6,823,672[r]	6,772,123	13,595,795
10,226,219	8,382,160	18,608,379
7,784,527	5,980,191	13,764,718
2,414,438	2,102,156	4,516,594
7,823,309	7,601,313	15,424,622
1,531,470	1,950,604	3,482,074
19,553,744	17,634,264	37,188,008
4,959,584	4,768,946	9,728,530
2,717,111	2,879,407	5,596,518
7,676,695	7,648,353	15,325,048
80,387,801[r]	73,874,548	154,262,349

urea and melamine, acrylic acid, and miscellaneous molding materials. [f] Includes data for petroleum resins, acrylic acid ester resins, mixtures, and miscellaneous synthetic materials. [r] Revised.

INJECTION MOLDS

THE FINEST EQUIPMENT

Whether you need a small mold or one for a 32 oz. machine, we have the equipment and the experience to carry the job from the original design through manufacture, up to the actual production test on our own Lester Molding Machine.

Manufacturers of Plastic Sheet and Rod Fabricating Machines

STANDARD TOOL CO.
83 WATER STREET, LEOMINSTER, MASS.

Outfitters to Plastics Mfrs. Since 1911

OMNI PRODUCTS CORP., Export Distributors, New York, N. Y.

Complete Line of

Machinery for Celluloid and Plastics Mfrs.

JOHN J. CAVAGNARO

HARRISON Engineers and Machinists ESTABLISHED 1881 NEW JERSEY

Presses for Dehydrating, Filtering, Caking, Polishing, Stuffing, etc.

Mixers: Plain or Stainless

Preliminary or Vacuum

CRESYLIC ACID
TRICRESYLPHOSPHATE
TRIPHENYLPHOSPHATE

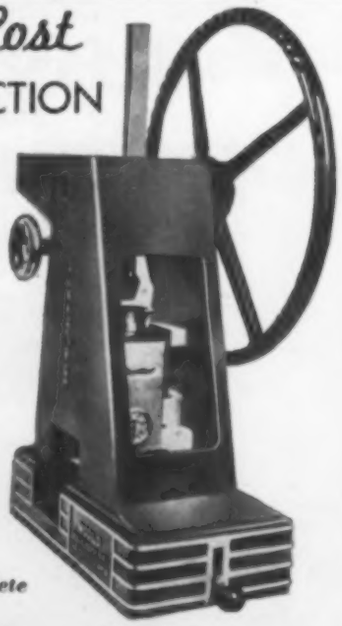
COALTAR CHEMICALS CORPORATION
William D. Neuberg, President
GRAYBAR BLDG., 420 LEXINGTON AVE., NEW YORK 17, N.Y.
TELEPHONE: MURRAY HILL 5-9508
CABLE: "COALTARKEM"

Lowest Cost
3/4 OZ. INJECTION MOLDER

New MOSLO MINIJECTOR has 4 other features:

1. Interchangeable injection units.
2. Molds *all* thermoplastics.
3. Quick-changing dies.
4. Utmost ease of operation.

Write today for complete details and prices.



MOSLO
MACHINERY CO.
CLEVELAND, OHIO

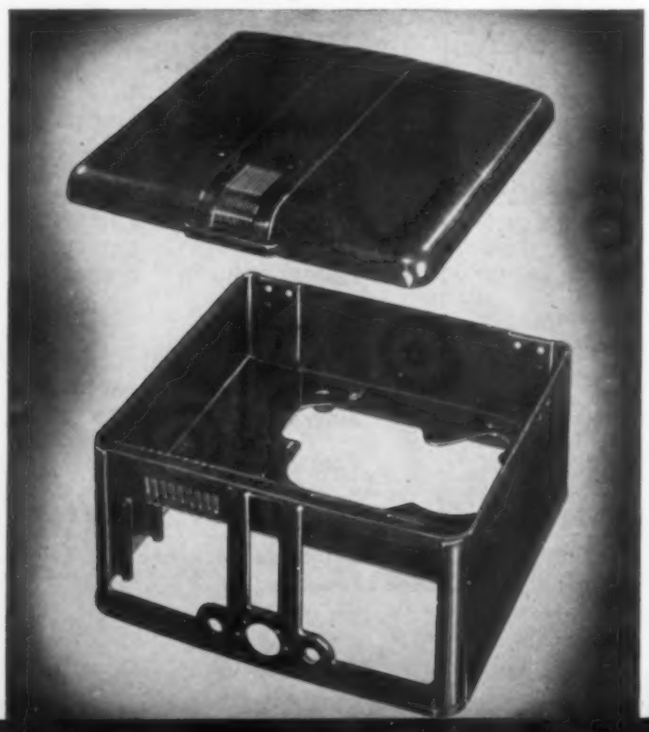
Completely assembled record player, lid up

Phenolic Record Player

ECONOMY in production, freedom of design, and ease of manufacture are among the reasons why molded phenolic was chosen for use in this combination radio-phonograph produced by Chicago Molded Products Corp., Chicago, Ill., for Motorola, Inc., Chicago, Ill.

The deck was molded as an integral part of the cabinet, and openings for operating mechanism, speaker grilles, dial, and control knobs were produced directly in the molding process. Total weight of the two large molded parts (cabinet and lid) is 9½ pounds.

The two large molded pieces; note deck in cabinet



precision-fabricated
PLASTIC DIALS

QUALITY and SERVICE AT A PRICE THAT'S RIGHT

You can't go wrong when you depend on Sillcocks-Miller for plastic dials. These experienced engineers are recognized throughout the industry for their ability to fabricate plastic materials to close tolerances. The combination of this skill and complete production facilities provides a dependable source for the quality and service you want —at a price that's right.

Write for illustrated booklet or phone South Orange 2-6171 for quick action.

THE SILLCOCKS-MILLER CO.

10 West Parker Avenue, Maplewood, N. J.
Mailing Address: South Orange, N. J.

SPECIALISTS IN HIGH QUALITY, PRECISION-MADE PLASTICS FABRICATED FOR COMMERCIAL, TECHNICAL AND INDUSTRIAL REQUIREMENTS.

Now you can Drill or Tap
Multiple 1/16" to 1/4" Holes
in plastics Faster, Better
with New NATCO A-33 Machine

NATCO A-33A Combination Hand and Foot and Air Oil Feed Machine with or without air operated automatic rotating table

• The new NATCO A-33 Light Sensitive Machines offer maximum production on plastics where super sensitive operations and high speed are of paramount importance. These NATCO machines offer flexible spindle arrangements for up to ten spindles. Spindle speeds from 650 to 3550 RPM are provided by quick-change sheave arrangement. Close control and high speed are features of all three models of the NATCO A-33 Machines providing the following feed arrangements: (Model A-33A) Hand and Foot Feed; (Model A-33A) Combination Hand and Foot and Air Oil Feed; (Model A-33B) Air Feed. Write Dept. MP for NATCO Bulletin 247.

Call a Natco Field Engineer

for High-Speed Supersensitive Drilling and Tapping in Plastics

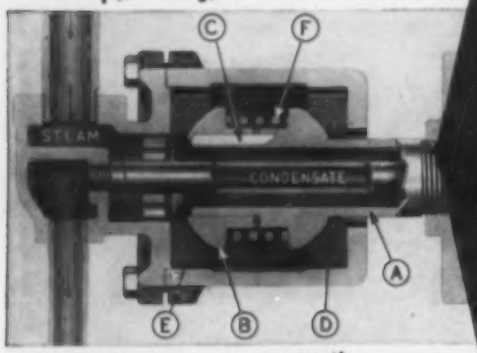
NATCO

NATIONAL AUTOMATIC TOOL CO., INC., Richmond, Ind., U.S.A.
Branch Offices: 1809 Engineering Bldg., Chicago • 409 New Center Bldg., Detroit • 1807 Elmwood Ave., Buffalo • 2902 Commerce Bldg., N. Y. City

Help FOR YOUR STUFFING BOX PROBLEMS . . .

Getting steam or liquids into rotating machine parts used to mean a lot of trouble with stuffing boxes and steam fits. The Johnson Joint has changed all that. It's completely packless, self-oiling, self-adjusting and even self-aligning. Industry is finding new uses for it every day. Type B illustrated provides for condensate removal; other styles and sizes for all needs. Write for details.

THE JOHNSON CORPORATION
817 WOOD ST., THREE RIVERS, MICH.



Nipple (A) connected to roll. Collar (B) is keyed (C) to nipple, but fits loosely so pressure can fill housing and force seal ring (D) in place. Both rings (D and E) are of carbon graphite, eliminate oiling and packing. Spring (F) lit for initial seating only.

JOHNSON Rotary Pressure JOINTS

PLASTIC BEADS
FOR EVERY PURPOSE!

TELL Plastic Beads are preferred by leading pearl, jewelry, novelty, toy and numerous other manufacturers from coast to coast. Expertly made from cellulose acetate material, TELL Plastic Beads are produced in a variety of spheres and shapes.

TELL Plastic Beads are available in the following colors and finishes:

- Alabaster base for pearlizing.
- Chalk white, pink, or blue with waxed finish.
- Gold, silver or rhodium plated.
- Manufactured according to specifications.

Sizes: 2½ - 3 - 3½ - 4 - 4½ - 5 - 5½ - 6 - 7 - 8 - 9 - 10 - 12 - 14 - 15 - 18 mms. may be ordered with or without holes. Submit your specifications or write for samples and prices.

TELL MANUFACTURING CO., INC.
31 Fulton Street • Newark 2, N. J.

Displays from Reprints

STARTING with ordinary magazine reprints, a process has been developed to turn these reprints into durable and attractive display panels by coating them with a layer of plastic. Vinyl was chosen for this job because of its non-warping and low moisture absorption qualities. This latest contribution to the effectiveness of point-of-sale displays was developed by the Ranger-Tennere Co., New York, N. Y., using Vinylite resin. Some examples of the company's work are pictured below.

Method of manufacture

The reprint, which is furnished by the advertiser or advertising agency, is sandwiched between a piece of ¼-in. hardboard and a layer of vinyl. The Ranger-Tennere laminating press completes the job by applying around 175 tons of pressure and up to 300° of heat, depending upon the colors in the reproduction. The result is a washable plaque having a long display life. The plastic coating gives the panel a smart finish and enhances the color of the underlying reprint. Colored backgrounds or edgings can be provided if desired. A combination easel and hanger is glued and riveted onto the back of each plaque.

Point-of-sale displays are now being coated with vinyl to provide a washable surface and long display life

The Better Way to PLASTICS MOLDING

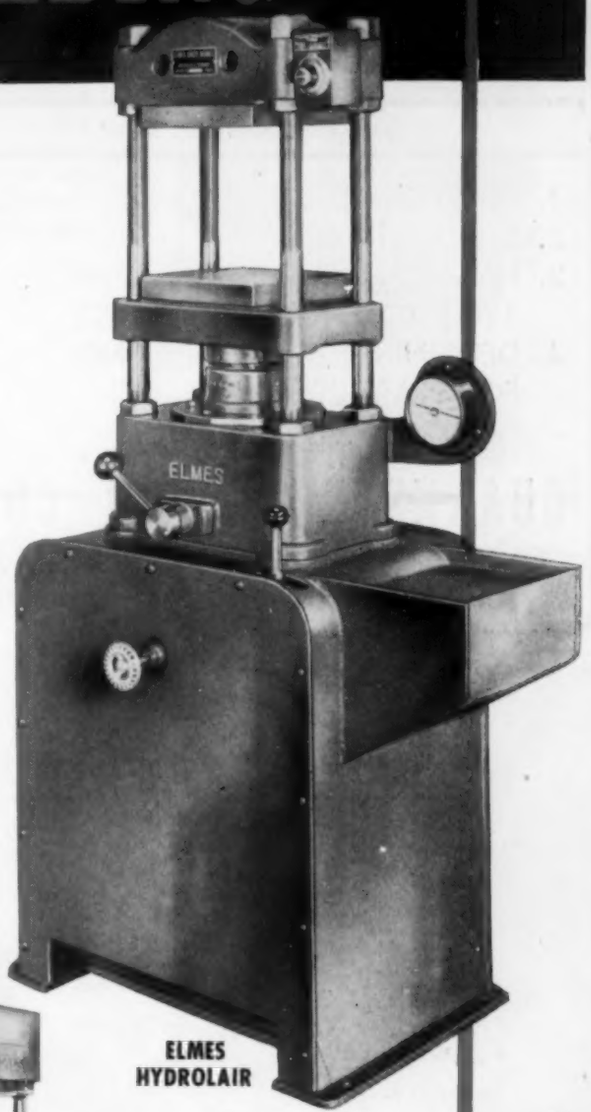
● Behind the excellent performance of Elmes hydraulic presses lies almost a century of molding experience—nearly 100 years of constant *improvement* in methods and machinery. Elmes equipment brings you the most up-to-date features . . . maintains the *quality* of your products . . . helps *speed production* and *cut costs.*

FOR CONFIDENCE IN YOUR PRODUCTION

Elmes presses are flexible, convenient, easy to use. Bring operating economies to *both* long and short runs. Handle a multiplicity of jobs. Your choice of full manual or time-cycle control—with *precise regulation* of speed, pressure, and time on *all* presses. Whatever the job or size of the order, you'll find Elmes hydraulic presses tops for speedy, *accurate* results. You can put your Elmes into *high-gear production* with confidence.

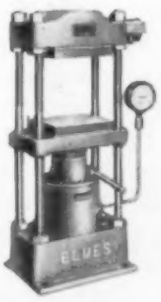
ALL ELMES FACILITIES AT YOUR SERVICE

Let Elmes experience and foresight serve *you.* Write or phone for assistance in solving your problems. No obligation. And ask for Booklet No. 5200—it gives you factful descriptions, detailed specifications of Elmes hydraulic equipment *for the plastics industry.* Write *today.* "Put *your* pressing problems up to Elmes."

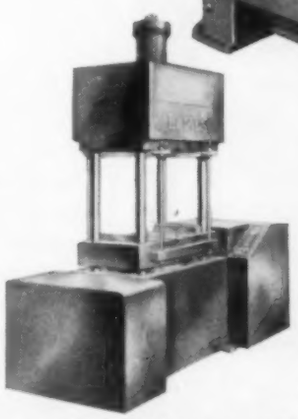


ELMES HYDROLAIR

COMPRESSION MOLDING PRESS



LABORATORY PRESS



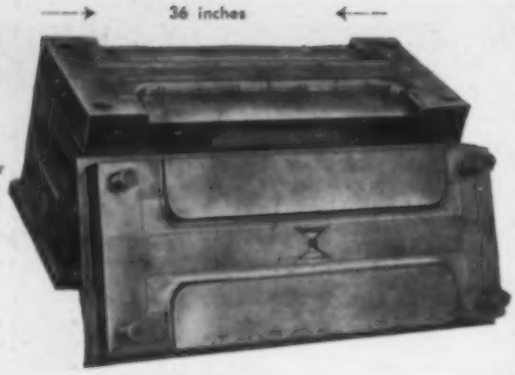
TRANSFER MOLDING PRESS

ENGINEERED BY ELMES
Good Hydraulic Production Equipment Since 1851

ELMES ENGINEERING WORKS *of* AMERICAN STEEL FOUNDRIES, 225 N. Morgan St., Chicago 7, Ill.

Distributors in Principal Industrial Centers

METAL-WORKING PRESSES · PLASTIC-MOLDING PRESSES · EXTRUSION PRESSES · PUMPS · ACCUMULATORS · VALVES · ACCESSORIES



2 Cavity "Refrigerator Mold"

16 Years of Continuous Service

1. PLASTIC MOLDS
2. DUPLICATING
3. HOBBED CAVITIES IN OUR 1200 TON HOBBING PRESS
4. DESIGNING & ENGINEERING FOR PLASTICS

write or phone

QUARNSTROM TOOL CO.

6698 E. McNichols Road, Detroit 12, Michigan

Telephone: TWINBROOK 1-8282

Miller

WOOD FLOUR

Formulated to meet the strict requirements of the plastic industry. Miller Wood Flour is an approved uniform product. Available in 4 standard grades, or made up to meet your particular specifications.

Prompt Shipment.
Phone, wire, write us regarding your requirements.

Frank Miller & Sons

2252 West 58th Street, Chicago 36, Illinois

Set of five cookie cutters pictured at right are injection molded of polystyrene. Attractive box displays cutters

These polystyrene cookie cutters come in a book-like package with children's story printed on the inside of the cover

Cookie Cutters

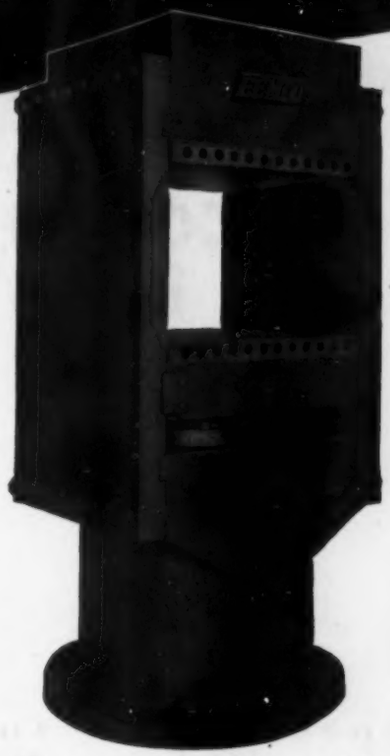
AMONG the many new applications of plastics in the home kitchen are cookie cutters molded of polystyrene. This material was chosen because of its excellent resistance to alkalies, salts, and aliphatic hydrocarbons. Another reason that led to the use of polystyrene is the fact that its water absorption is negligible even after long immersion, and it is nontoxic and odorless.

The Story Book Cookie Cutters pictured here are molded by the Century Plastic Co., Hudson, Mass., for the A. F. Perry Co., Inc., Leominster, Mass. The cutters are molded in an eight-cavity combination mold that produces two each of four different types. Another interesting feature of this line is the colorful book-like package that contains the cutters. A children's story, such as "The Three Bears and Goldilocks," is printed on the inside front cover and the back cover. Children may use the box as a story book, or as a box for storing knickknacks.

The Hansel and Gretel cookie cutters are molded by the Berkeley Engineering and Manufacturing Co., Berkeley Heights, N. J., for the Educational Products Co., New York, N. Y. Loalin, Lustron and Bakelite polystyrene are used interchangeably. The set consists of five pieces molded in a 10-cavity mold, producing two sets at a time. The cookie cutters are so designed that the resulting cookies will have not only the desired outline and shape, but detail as well. Printed inside the lid of the box holding the cutters is the story of Hansel and Gretel, and three recipes.

PRESSES

FOR RUBBER & PLASTICS PROCESSING



Manufactured in all sizes, EEMCO hydraulic presses are furnished with or without self-contained pumping units or special features. Built for heavy duty and especially designed to save you money on maintenance and operating costs. It will pay you to consult with EEMCO engineers on all rubber and plastics processing machinery needs.

SALES REPRESENTATIVES

MIDWEST
HERRON & MEYER OF CHICAGO
38 South Dearborn Street
CHICAGO 3, ILL.

OHIO
DUGAN & CAMPBELL
907 Akron Savings & Loan Bldg.
AKRON, OHIO

EASTERN
H. E. STONE SUPPLY CO.
OAKLYN, N. J.

MILLS · PRESSES · TUBERS
EXTRUDERS · WASHERS · CALENDERS
STRAINERS · CRACKERS · REFINERS

EEMCO ERIE ENGINE & MFG. CO.

953 EAST 12th ST., ERIE, PENNA.

WE BUY IT...
SELL IT...
RE-WORK IT

PLASTIC SCRAP

Plastics Division:

H. MUEHLSTEIN & CO. INC.

122 EAST 42nd STREET, NEW YORK 17, N. Y.

BRANCH OFFICES: Akron · Chicago · Boston · Los Angeles · Memphis

WAREHOUSES: Jersey City · Akron · Boston · Los Angeles · Memphis

Shawnee
REG. U.S. PAT. OFF.
DRY COLORS
COLORS FOR PLASTICS

•

Red & Yellow
Cadmium Toners

•

Strontium Chromate

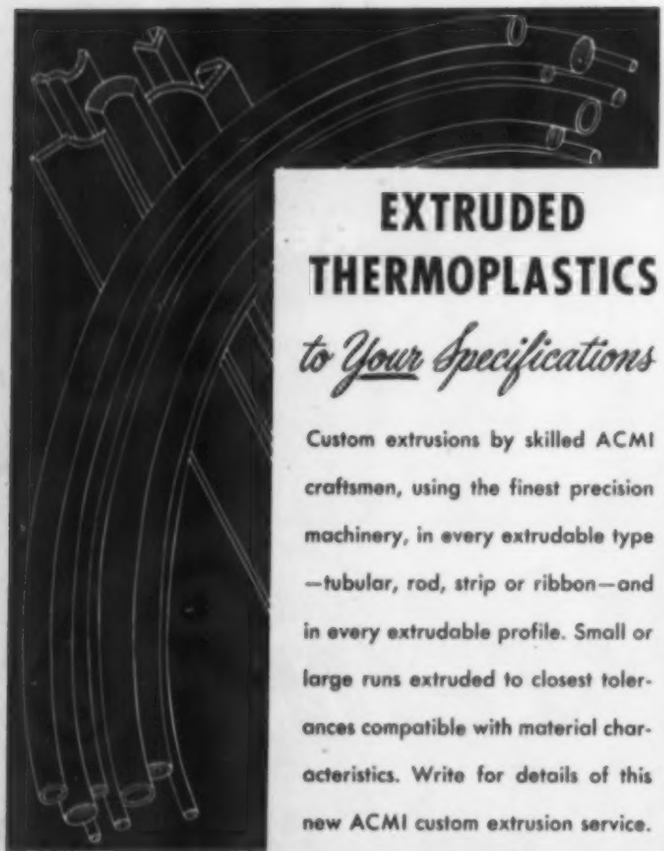
•

Organic Red, Maroon,
Blue & Green Toners

•

Offerings based on extensive experience with leading plastics manufacturers

KENTUCKY COLOR & CHEMICAL CO.
Incorporated
General Office and Works: Louisville, Ky.
Branches and Representatives in Principal Cities



EXTRUDED THERMOPLASTICS
to Your Specifications

Custom extrusions by skilled ACMI craftsmen, using the finest precision machinery, in every extrudable type—tubular, rod, strip or ribbon—and in every extrudable profile. Small or large runs extruded to closest tolerances compatible with material characteristics. Write for details of this new ACMI custom extrusion service.

AMERICAN CYSTOSCOPE MAKERS, INC.
1241 LAFAYETTE AVENUE • • NEW YORK 59, N. Y.

Hole on top of handle can be turned to select any of eight drill points. Desired point comes out when drill is tipped

Drill Handle

FURNISHING storage space for drill points, an innovation in drill handles is made of cellulose acetate butyrate, chosen for this application because of its dimensional stability and impact strength. The automatic push drill, illustrated here, is manufactured by the Millers Falls Co., Greenfield, Mass. The plastic handle is injection molded of Tenite II by the Worcester Molded Plastics Co., Worcester, Mass.

The top of the handle carries an index ring which gives the number and diameter of the drill point to be found in each of the eight molded-in compartments. The drill points can be easily removed from the spring-operated handle by releasing the lock and turning the handle until the desired number or size, as indicated on the index ring, is directly under the hole in the cap. Then by tipping the drill, the point slips out. The drill uses a spiral and center nut, standard in all the company's automatic drills.

Eight holes for drill points, and depression to engage lock are molded into cellulose acetate butyrate handle

H&D BOXES

This corrugated package will deliver its contents from the manufacturer to consumer without repacking in perfect condition and will be attractively displayed at point of sale. In the home, it will provide clean, durable storage for many years to come. Here is a typical example of how an H & D box can make a good product *better*. Consult the Hinde & Dauch Package Laboratory on ALL packaging problems.

REG. U. S. PAT. OFF. H&D

HINDE & DAUCH

Authority on Packaging

EXECUTIVE OFFICES: 4803 DECATUR ST. • SANDUSKY, OHIO

FACTORIES IN:

BALTIMORE 13, MD. • BUFFALO 6, N. Y. • CHICAGO 32, ILLINOIS
CLEVELAND 2, OHIO • DETROIT 27, MICH. • GLOUCESTER, N. J.
HOBOKEN, N. J. • KANSAS CITY 19, KANSAS • LENOIR, N. C.
MONTREAL, QUEBEC • RICHMOND 12, VA. • ST. LOUIS 15, MO.
SANDUSKY, OHIO • TORONTO, ONTARIO • BOSTON, MASS.

Permanent Magnetic Power TO STOP TRAMP IRON!

NEW—DINGS

ALNICO PERMA • PLATE MAGNET

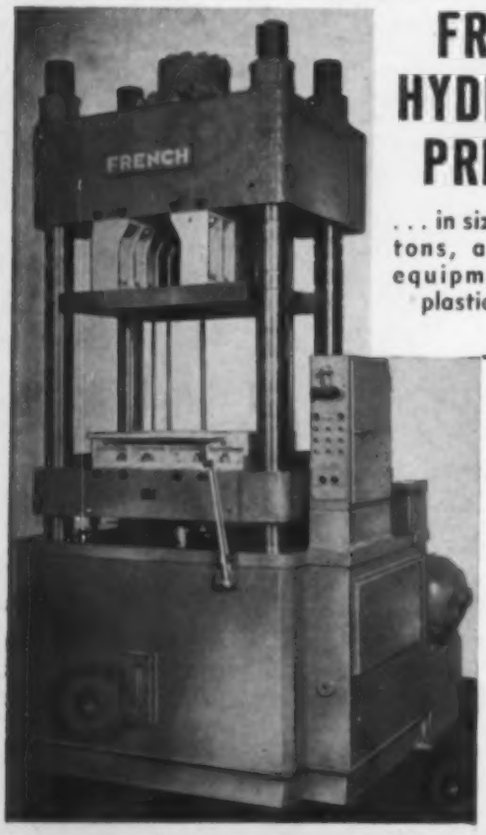
Here's the low cost, positive, modern way to get iron out of your product, protect machinery, prevent fire or explosion due to iron sparks. Powerful . . . lightweight . . . inexpensive . . . easy to install . . . non-electric . . . no operating cost . . . advanced design . . . *magnetic permanence guaranteed for life!* For installation in chutes or above belts. Standard widths 4" to 72".

WRITE FOR BULLETIN NOW.

DINGS MAGNETIC SEPARATOR COMPANY

4737 W. McGeogh Ave., Milwaukee 14, Wis.

A Complete Line of Permanent and Electromagnetic Separators



FRENCH HYDRAULIC PRESSES

. . . in sizes up to 1,500 tons, are standard equipment in the plastics industry.

Write for our catalog.

THE FRENCH OIL MILL MACHINERY CO.
(HYDRAULIC PRESS DIVISION)
PIQUA, OHIO U.S.A.

1 — Cellulose acetate and cellulose acetate butyrate are the materials used to injection mold these colorful animals

"What-Not" Animals

HOME "what-not" shelves for years have displayed glass animals and other figures of varying size and shape. Now similar decorations are being molded of polystyrene, cellulose acetate, cellulose acetate butyrate, and acrylic. These new plastics novelties are low in cost yet are so molded as to incorporate great detail.

A number of such animal figures are injection molded by Nosco Plastics, Erie, Pa. In Fig. 1, the animals are made from Tenite I and II in molds of eight, six, and three cavities. The Buck-N-Doe, in Fig. 2, are molded of clear or frosted acrylic in a single-cavity mold at a cycle of close to 4 minutes. The set of animals in Fig. 3 are molded in a 12-cavity injection die at a cycle that runs a little better than 1½ shots per minute. They are all of Tenite I except the three transparent animals at the bottom of the picture, which are made from Lumarith.

In order to remove all evidence of the parting line and gate in the Nosco animals, and to develop the desired luster, a considerable amount of buffing is performed on each piece.

The Animal Parade figures (Fig. 4) are injection molded in a six-cavity combination mold by Tri-State Plastics Molding Co., Henderson, Ky. The material used is Styron. The marketing of these animals is done by Interstate Plastics Corp., New York, N. Y., which supplies each store that sells the Animal Parade with a display consisting of a small round mirror with a set of animals glued to it.

2 — Molded in clear and frosted acrylic, the buck and doe are plastic items replacing the old familiar glass types

3 — The tiny animal figures in this set are molded of cellulose acetate. Great detail is incorporated in the molding

4 — This set of animals is injection molded of polystyrene in a six-cavity combination die. The figures are attractive when used on the home "what-not" shelf or otherwise displayed

EXPERIENCE *that counts!* *for Your Mold Building*

Many of the Nation's largest molders rely on us exclusively for designing and building their molds.

Why? Because—

We are one of the pioneer engineering firms—we have had unexcelled experience—and—*we have designed and built molds which always "do their job."*

You can count on this experience, too! Rely on our proved performance for your all-important mold-building needs.

Phone or write for information.

AMERICAN PLASTICS ENGINEERING CORP.
3020 E. Grand Blvd., Detroit 2, Mich.
Madison 7235

AMERICAN PLASTICS ENGINEERING

Special types have been developed for each plastic

Pearl Essence

THE MEARL CORPORATION
153 Waverly Place New York, N. Y.

INORGANIC PIGMENTS *for plastics*

INSOLUBLE
HEAT AND LIGHT RESISTANT

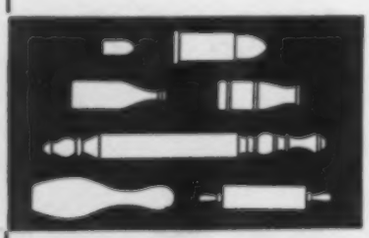
Let us know the application . . .
Get complete details

WRITE B. F. DRAKENFELD & CO., INC.
45-47 Park Place, New York 7, N. Y.

Drakenfeld

PRECISION GROUND PEARLS AND SHAPES

The same process that made possible the mass-production of these lustrous, warm-to-the-touch plastic pearls*, can make a variety of beads, balls and other shapes to your specifications.



Illustrated here are several of the infinite number of shapes which we can grind for you from plastic, fiber, hard rubber, wood or other materials.

*Made from Kopper's Cellulose Acetate.

ORANGE MACHINE PRODUCTS, INC.
82 Main Street West Orange, New Jersey
Orange 5-4645

Lens Attachment

PHOTOGRAPHIC results formerly obtained only through the use of high-priced variable diffuse image lenses on enlargers are now being achieved through the use of a lens attachment made of polystyrene and acrylic parts. The lens attachment is known as Pictrol.

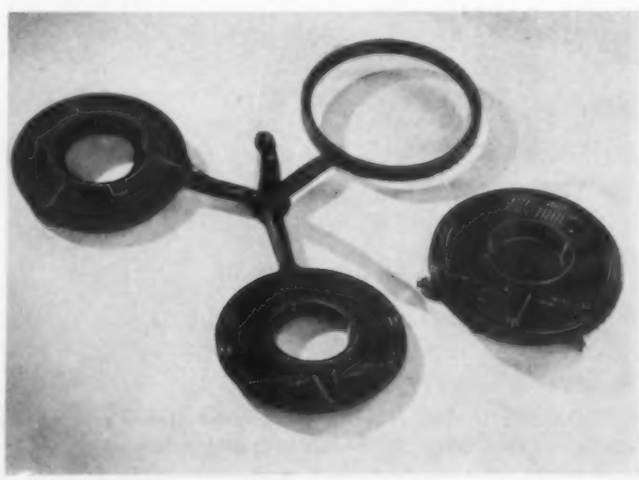
The three parts for the body of the lens attachment (front, back, and ring) are molded from black Styron. Clear Plexiglas is used for the variable leaves which give the diffusing effect. The front, back, and ring are produced in a 3-cavity injection mold, and the leaves in a 12-cavity injection mold. The front and back of the body are cemented together over an aluminum disk. When assembled, the ring part of the body contacts the disk for hand movement. The ring moves freely, causing the leaves to open and close, thus varying the degree of diffusion obtained. The parts for the lens attachment are molded by the Apex Tool & Machine Co., Glendale, Calif., for Berlant Associates, Los Angeles, Calif.

Various degrees of diffusion

When Pictrol is used in conjunction with an enlarger, it provides the effect of a variable soft focus lens which gives any degree of diffusion from razor-sharp to misty soft and virtually eliminates retouching as well as spotting. It reduces grain, and imparts to the print a professional quality of pictorial softness.

Of primary interest is the fact that diffusion is controlled by means of the calibrated ring. The user may achieve any degree of softness simply by turning the ring. Once having achieved the desired effect, identical prints may be made.

Lens attachment has three black polystyrene parts, molded in a three-cavity die. Variable leaves are molded of acrylic



MONOPLEX

Monomeric Plasticizers for Vinyl Resins

For every product based on polyvinyl chloride and related copolymers there's a MONOPLEX plasticizer that's designed to provide the properties you need. The data in the table below highlight the efficiency, low-temperature flexibility, heat stability, and resistance to water extraction that you can obtain with these outstanding products . . . specify MONOPLEX when you think of monomeric plasticizers.

PROPERTY*	MONOPLEX 11 (ester type)	MONOPLEX DBS (dibutyl sebacate)	MONOPLEX 5 (dibenzyl sebacate)	MONOPLEX DOS (dioctyl sebacate)	MONOPLEX 16 (nitrile type)
100% Modulus (psi.)	630	630	890	910	1100
Tensile Strength (psi.)	2390	2050	2520	2310	2700
Ultimate Elongation %	290	340	320	360	340
Shore Duro A Hardness	68	66	71	76	76
Kemp Bend Brittle Point., °C.	−29	−67	−33	−62	−42
Heat Stability (Hours at 150° C.)	5	5	4	5	8
Ultra-Violet Stability (Weatherometer)	Moderate	Moderate	Good	Moderate	Good
Volatility, (% weight loss)	3.4	9.8	2.7	0.4	0.4
Water Extraction (% weight loss)	1.3	0.3	0.9	0.1	0.1
Oil Extraction, (% weight loss)	11.6	24.6	16.2	22.5	21.0

*As measured from a standard formulation:

Vinyl Resin	63.5
Plasticizer	35.0
Basic Lead Carbonate	1.0
Stearic Acid	0.5
	100.0

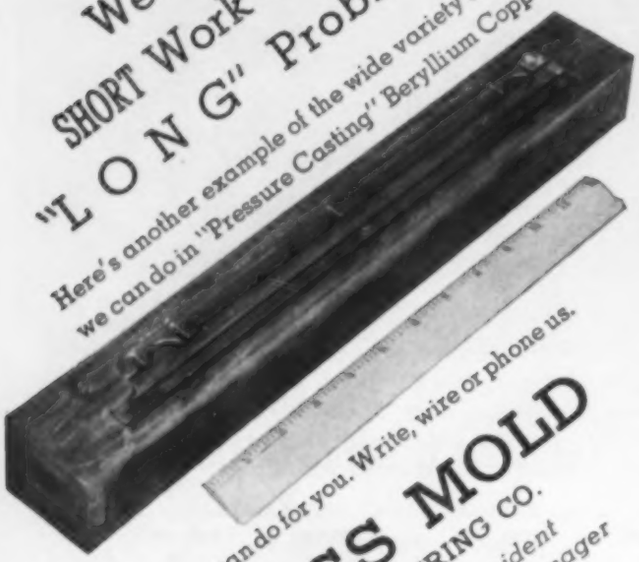
We'll be glad to send you full information concerning MONOPLEX plasticizers. Make your inquiry as detailed as you wish. Our technical staff is always happy to suggest the proper MONOPLEX for a specific application.

MONOPLEX *is a trade-mark, Reg. U. S. Pat. Off.*

Represented by Cia. Rohm y Haas, S. R. L. Carlos Pellegrini 331, Buenos Aires, Argentina, and agents in principal South American cities

THE RESINOUS PRODUCTS & CHEMICAL COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

We make
SHORT Work Out of
"L O N G" Problems!
Here's another example of the wide variety of work we can do in "Pressure Casting" Beryllium Copper.

Find out what we can do for you. Write, wire or phone us.
PROCESS MOLD
AND MANUFACTURING CO.
Ralph Chapman, President
John Koons, General Manager
6455 E. Lafayette Ave.
Detroit 7, Michigan
Phone—LOrain 7-0365
LOrain 7-0366

Specialists in Small Moldings

WARREN PLASTICS CORPORATION
900 Irvine Street
WARREN, PENNSYLVANIA
NEW YORK SALES OFFICE: JESSELSON SALES CO., INC., 347 FIFTH AVE.
CANADIAN PLANT: WORLD PLASTICS CORP., LTD., HAMILTON ONT.

Fluorescent dye particles in acrylic material reflect light rays and give sign appearance of being edge-lighted

Self-Illuminated Acrylic

A NEW form of acrylic recently introduced by the Rohm & Haas Co., Philadelphia, Pa., is now being used to produce signs with self-illuminated lettering that glows brilliantly under its own power.

This fluorescent phenomenon is caused by millions of fluorescent dye particles with which the acrylic is impregnated during manufacture. The particles of dye reflect light in all directions when they are struck by light rays entering the sheet. Most of the reflected rays are trapped within the polished sheet and travel through it by repeated interior surface reflections to the edges, where they escape in a high concentration of fluorescent light. The same luminous color that distinguishes the edges also outlines letters and designs that are carved into or painted on the surface of the sheet.

Built-in edge-lighting

This material, called Daylight Fluorescent Plexiglas, is shatter-resistant, light in weight, and can be formed by methods applicable to standard acrylic sheeting. It may be worked and machined like wood and soft metals. The material has been described as having "built-in edge-lighting," because exposure of the plastic to daylight or normal room illumination results in edge-lighted effects ordinarily obtained by directing light into the edge of the material.

Indoor signs, decorative panels, and large individual block and script letters are some of the uses for this new material. Letters may be shaped from fluorescent strips and mounted to present a single flowing edge. They may also be formed from large sheets so that a double outline is in view. Such letters have the appearance of lighted neon tubing.

Cross an Orchid

WITH ARMOR PLATE . . .

This is about a lovely new material that has a combination of beauty and durability your customers have wanted for a long time.

It is called *Resproid*. It comes in a bouquet of fresh, spring-like colors that can be cleaned in seconds with just a damp cloth. And it is practically indestructible in everyday use, for *Resproid* is specially made to resist cracking, fading, scuffing and abrasion — perspiration, most acids, alkalies, oil and alcohol.

Resproid comes in a wide range of lovely styles and weights — from transparent to thick enough for upholstery — that give new beauty, new practicality, to shower curtains, waterproof garments, aprons, cottage sets, handbags, luggage, belts — a variety of products as limitless as your own imagination.

With a big, new full color advertising campaign in Good Housekeeping magazine telling over 5,500,000 potential customers about *Resproid's* beauty and resistance to wear, there is a profit opportunity here you can't miss out on. If you're not already using *Resproid* in your lines, write for samples today. Respro Inc., Cranston 10, R. I.

Resproid

TRADE-MARK REG. U. S. PATENT OFFICE

Show this tag on all your Resproid products. It's an important selling point for you!

Resproid

REPLACEMENT OR RETURN OF MONEY GUARANTEED BY GOOD HOUSEKEEPING IF NOT AS ADVERTISED THEREIN

Guaranteed by Good Housekeeping

READY TO INSTALL...

THE
KANE
LOW WATER LINE
AUTOMATIC
GAS-FIRED
STEAM
BOILER

— "built to order" in 1-2-3-5 H.P. sizes for the operating pressure you require. It's compact . . . saves floor space . . . can be placed right next to the press it serves; permits gravity return of condensate . . . eliminates long pipe lines and traps; burns fuel only in proportion to the steam used. (For multiple press installations, there's the KANE Standard Boiler, to 30 H.P. and the M-K-O Condensate Return System.)

MEARS·KANE·O'FELDT INC.
1903-1915 EAST HAGERT STREET, PHILADELPHIA 25, PA.
FOUR DECADES OF AUTOMATIC GAS-FIRED BOILER MANUFACTURING EXPERIENCE.

Consult
Waterbury
for
Molded
Plastics

- Creative Service in Product Development
- Research, Design; Engineering Counsel
- Compression; Transfer; High Speed and Injection Molding
- Over a Century of Fine Tool Work
- Finishing, Assembling, Packaging

Our technical staff will gladly confer with you
Write for Waterbury Plastics Catalog

WATERBURY COMPANIES, INC.
South Main St. Waterbury, Conn.

Vinyl-Metal Combination

A MATERIAL which can be used for sealing porous castings or seams in metal work has been produced by combining a metallic filler and a specially prepared vinyl compound. The filler may be powdered aluminum, steel, or almost any other metal.

The new material, called Plastic Metal, is sold by National Engineering Products, Inc., Washington, D. C. It is designed to provide tenacious adhesion to all of the common metals.

Plastic Metal is particularly useful where aluminum is employed or where the use of a soldered joint is difficult. It is suggested as a sealing or filling compound for welded or riveted seams in airplanes, truck bodies, refrigerators, washing machines, and other metallic structures requiring the use of a fairing compound. It can also be used where a material resistant to chemicals is required.

To facilitate spreading, or to compensate for lost solvent, Plastic Metal can be diluted by the addition of ketone or toluene. For brush application, the use of some slower solvent, such as Cellosolve, is desirable. Plastic Metal can be removed with ketone.

The material solidifies through the evaporation of solvent at room temperatures. Thin sections reach maximum hardness in 4 hr., but thick sections will continue increasing in adhesion, toughness, and hardness over a 96-hr. period. Where thicknesses in excess of 3/32 in. are desired, the use of two thin coats is preferable to a single thick one.

According to the producer, Plastic Metal forms a bond to all metals and some other materials, including concrete. It retains its properties permanently over a temperature range extending from 220 to —65° F., and the fully dried material may be sanded, buffed, and cut with a knife or the tools used to work wood or metal. When used over an aluminum seam and buffed, it takes on the same color as the aluminum.

Impervious to solvents

The manufacturer further declares that Plastic Metal will not support combustion and that it is impervious to alcohol, gasoline, oil, water, a saturated salt solution, carbon tetrachloride, and many 10% acid solutions, such as nitric and sulphuric. It is resistant to weathering and has withstood an accelerated aging cycle equivalent to two years of weathering in Florida. Developers claim that it has no tendency towards galvanic action when applied to galvanized sheets, aluminum, copper, magnesium, and the ferrous metals—probably because the material is an electrical non-conductor. The completely dried material has a specific gravity of approximately 1.66 and is available in containers of ½ pt. to 1 gal. It weighs about 13 lb. per gallon.

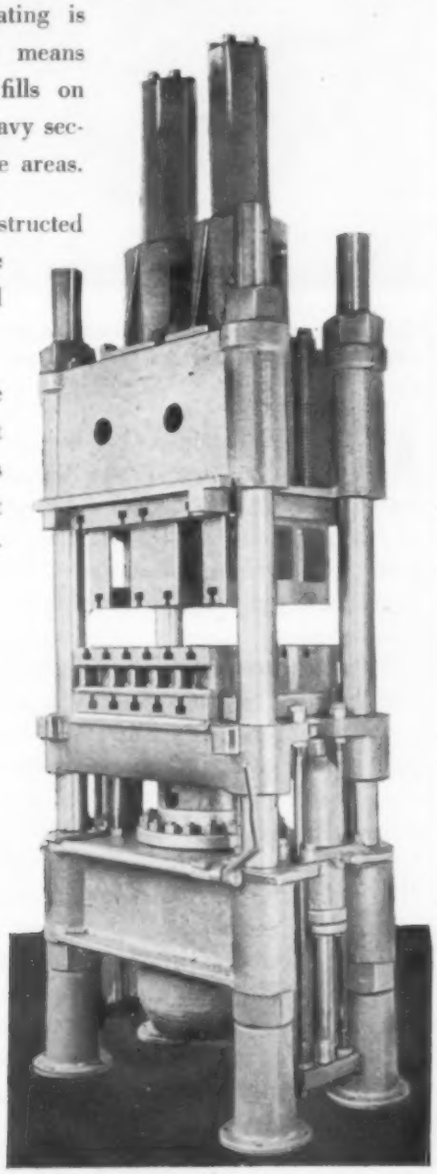
TWO HEADS ARE BETTER THAN ONE

Illustrated here is something really new in presses. It's our latest development—a double ram transfer molding press.

As this press has two overhead rams and two sprues, the necessity of center gating single cavity molds is eliminated. This feature increases the possibilities for mold design where point of gating is important. It also means better and faster fills on pieces that have heavy sections covering large areas.

The press is so constructed that only one of the rams may be used if desired.

Several of these presses are in use at Hemco Plastics Division, Bryant Electric Co., Bridgeport, Conn.



We invite your inquiries if you are interested in increasing production.

Dunning & Boschert
PRESS CO., INC.
331 West Water Street — Syracuse, New York

New
CUSTOM COMPOUNDING
Service
for Extruders and Molders

WESTCHESTER PLASTICS, INC.
specialists in

CELLULOSE ACETATE MOLDING POWDERS
Colors matched to specification.
Accurate color dispersions.

UNBREAKABLE RECORD PREFORMS
For low or high pressure presses.

COLOR CONCENTRATES
For POLYETHYLENE, VINYL and GEON

CHEAPER · FASTER · EASIER
Smaller color inventory needed.
Your product finished at
color costs as low as 4¢ per lb.

Write for Prices and Color Samples to:

WESTCHESTER PLASTICS, INC.
326 WAVERLY AVE., MAMARONECK, N. Y.

CUSTOM COMPOUNDERS OF THERMOPLASTIC MATERIALS

ANNOUNCING...

platensmooth paper

for smoother surfaced laminates

Platensmooth Paper* was developed to meet the demand for a specialized substance to give a smooth, finished surface to laminates and all articles produced on laminating presses.

In use, Platensmooth Paper acts as a shock absorber. Placed above and below the item being pressed, it takes up platen irregularities and distributes pressure evenly, assuring polished, smooth surfaces, free from flaws and mars.

Platensmooth Paper is of uniform strength and thickness throughout and is completely free from acid residue or fillers. It consists solely of neutral paper fiber and is not affected by temperature or pressure.

FREE SAMPLES

Platensmooth Paper is run to order and delivered in rolls or flat sheets cut to platen size. You can get Platensmooth Paper in gauges from .018" to .050", depending on temperature and pressure you wish to use. Free samples are available on request. Write for them today.

GENERAL PAPER & TWINE CO.

Exclusive Distributors

553-555 Belmont Ave. Newark 8, New Jersey

**Manufactured by Hollingsworth & Vose Co., East Walpole, Mass.*

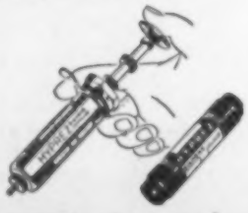
PLASTIC MOLDS

Quickly and Economically Finished to Perfection With

HYPREZ

DIAMOND COMPOUNDS

We will gladly recommend the proper grades for a complete and perfect job from our 23 engineered standards in cartridges with Hyprez applicator gun.

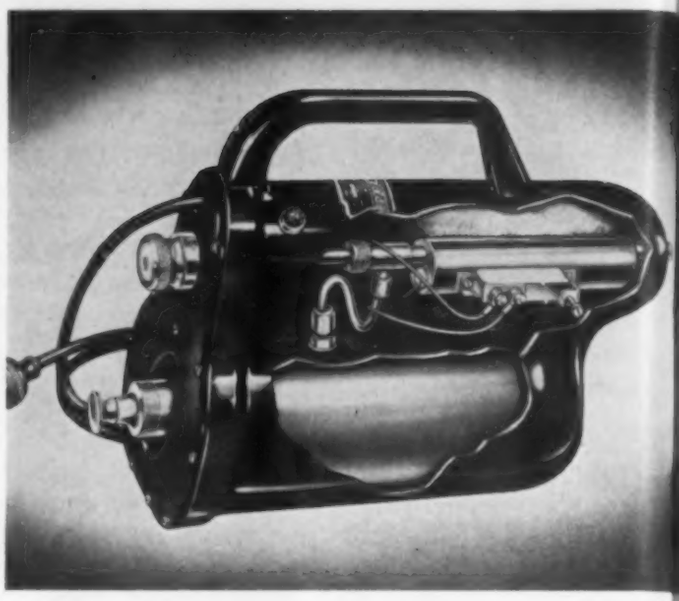


HYPREZ DIVISION

ENGIS EQUIPMENT COMPANY

431 So. Dearborn St., Chicago 5, Ill., U.S.A.

A Dry Vapor



Cut-away view of phenolic dry vapor gun shows the supply tank for the insecticide and the pump unit for pressure

A DOUBLE problem in the development of almost every new product is the selection of the most suitable materials for the job to be done and the most economical materials from a production viewpoint. When no common denominator can be found, the product seldom gets beyond the developmental stage.

Physical properties of different materials vary so widely that product designers often discover that several materials may be required to complete the new product. This factor can have the undesirable result of pushing production costs above the line where the product is profitable to manufacture.

Engineers at Mayfair Industries, Inc., Chicago 18, Ill., encountered this problem during the development of the housing for their new Commando Aerosol Gun—a device which dispenses an insecticide in the form of dry vapor. The mechanism to be housed consisted of a supply tank for the insecticide, a pump unit for pressure, and a thermostatically controlled heating unit for converting the insecticide into dry vapor form.

Requirements of housing

At first consideration, the material for the housing had to have a combination of physical properties which would require the use of at least two different structural materials. It had to be readily formable to the desired design. It had to be light for easy manual handling, yet strong enough to withstand considerable rough handling. It had to be non-conductive from an electrical standpoint and from a heat standpoint. There was one answer—plastics.

Aerosol Gun

Insecticide, emitted from gun in form of a dry vapor, is deadly to cockroaches, mosquitoes, and many other insects

Further investigation proved the most economical type to be a thermosetting phenolic plastic. In addition to obtaining the desired combination of physical properties, this material requires no finishing as it comes from the mold with a glossy wearproof surface. By using molded-in inserts, assembly costs could be kept at a minimum.

Durez phenolic was used to produce the three plastic parts required. Chicago Die Mold Corp., Chicago 39, Ill., molds both the handle and the two-part housing. The assembled gun is 12 in. long, 9 in. high, and weighs about 6 pounds.

Vapor discharged 8 to 10 ft.

The Commando Aerosol gun is easy to operate. The filler cap is removed and the insecticide poured in. A few minutes after being plugged into an electrical outlet, the heating unit is ready to convert the liquid into a dry vapor. The gun is capable of discharging the dry vapor a distance of 8 to 10 ft. and forms a fog which is not readily dissipated.

Properties of insecticide

According to the manufacturer, no oily film or unpleasant odor results from this vapor, and the preparation used in the gun has reportedly been established as non-toxic by testing laboratories.

Using a new principle of pest control, the dry vapor is recommended to kill cockroaches, mosquitoes, flies, bedbugs, moths, spiders, fleas, and other insects. While designed primarily for commercial, industrial, and institutional use, the new gun may well find ready acceptance by home owners.

MOLDS

FOR PLASTIC MATERIALS

INJECTION-COMPRESSION

TRANSFER AND PLUNGER

We are pioneers in the plastic trade. Our modern plant is equipped to handle your plastic mold problems. Our capable staff will engineer, design, engrave, hob and harden your molds in each of our various departments.

Your molds are tested in our injection machine before leaving our plant. This new added service now assures you of perfect pieces and immediate production.

FORTNEY MFG. CO.

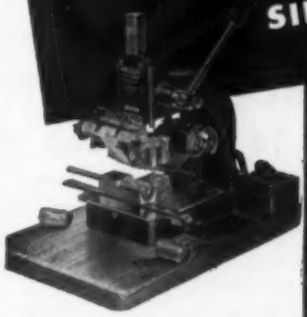
INCORPORATED

247 N. J. R. R. Ave. Newark 5, N. J.

PLASTIC MARKINGS

IN GOLD

SILVER or COLORS



YOU can stamp trademarks, names and designs on thermo-plastics, etc., right in your own plant with the small, precision-built Kingsley Machine.

Production up to 800 stampings per hour can be obtained with unskilled operators.

Send samples and details of your stamping problems.

Kingsley

STAMPING MACHINE CO.

HOLLYWOOD 28, CALIFORNIA

Plastic
MOLD DESIGNS

Injection Molders
Nylon and all Thermoplastics

Automotive Products and Novelties

SINKO
MANUFACTURING & TOOL CO.
2947 N. Oakley Avenue Phone LAkeview 4220 Chicago, Ill.

from a delicate pre-heating job to a "workhorse" heating task

there's a WATLOW HEATING UNIT to fit the Job

Of the hundreds of standard sizes and shapes, there's a specific Watlow unit constructed especially for your type of heating job in the proper size, rating and capacity.

Whether your job is melting, liquefying, preheating, boiling or hardening, Watlow units offer clean, dependable controlled heat. Cartridge units, immersion heaters, strip units, band heaters and hot plates. Available in assemblies and with controls.

Send for electrical heating data catalog.

SPECIALISTS IN ELECTRIC HEATING UNITS
WATLOW
ELECTRIC MANUFACTURING COMPANY
1328 N. 23d St. St. Louis 6, Mo.

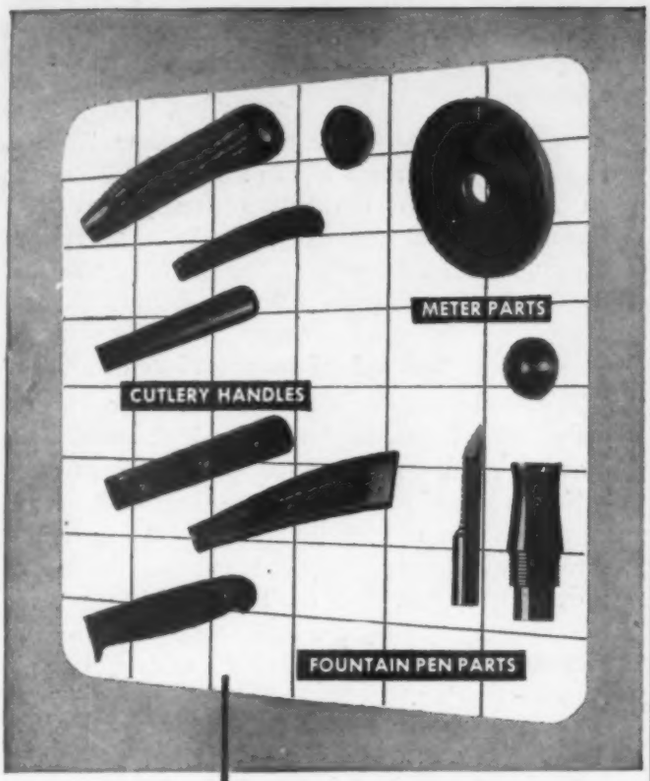
A worker "skins" a vinyl bag from wet butyral mix. This moistureproof bag can be used again for shipping purposes

Vinyl Shipping Bags

WET butyral mix, an ingredient used in the production of safety glass interlayer material, requires a moistureproof container for shipment. New vinyl bags manufactured by the Kestral Corp., Springfield, Mass., are now being used successfully to ship this mix from the South Charleston, W. Va., plant of Carbide and Carbon Chemicals Corp. to the Bound Brook, N. J., plant of Bakelite Corp. These bags, which are made of Vinylite plastic, can be used repeatedly even though they get rough handling. They have high tear resistance and chemical inertness. Holes caused by excess wear or cutting can be repaired by heat sealing.

No danger of lint

In addition to serving as a carrying case for wet mix, these bags are being adopted by chemical and other companies where lint from a shipping container would damage or contaminate the material.



The manufacturers of products using these parts investigated and are now using hard rubber.

Is *hard rubber* the best *plastic* for your part or product?

With the development of synthetic formulas, hard rubber, one of the oldest plastics, became one of the newest. Improved formulas are constantly being developed in crude, synthetic and combinations of both. Just the formula you need for your part or product may have been recently developed.

Here are some of the reasons why many manufacturers use hard rubber for parts like those illustrated:

HARD RUBBER:

1. Withstands oil, water, heat, cold and changing temperatures.
2. Resists alkalies, hot soap solutions and most solvents and acids.
3. Finishes to lustrous ebony.
4. Resists chipping, splitting and cracking under normal usage or when dropped.
5. Machines well.
6. Molds beautifully.
7. Often costs less than other plastics.

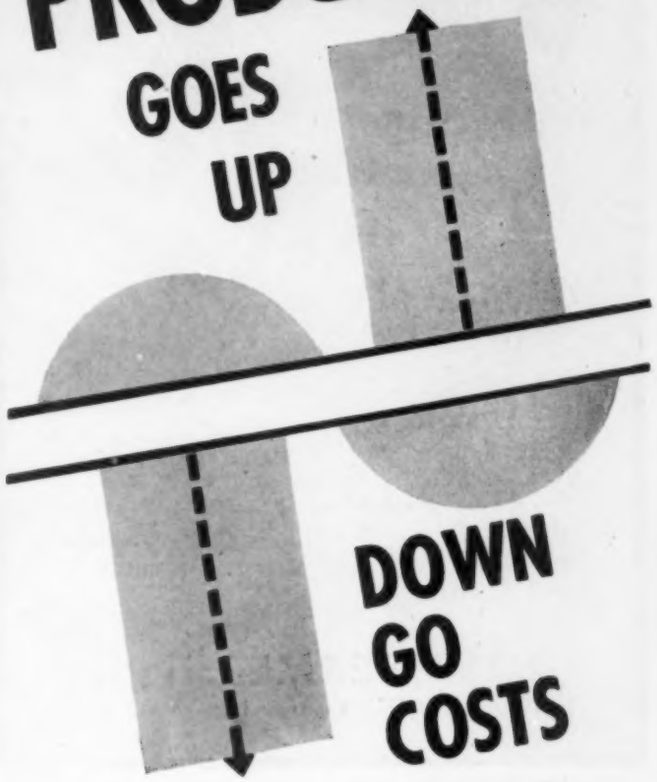
If you are planning or using large quantities of a product that approximates these parts in size, shape, physical and chemical requirements, chances are that our experience and facilities for large volume production will fill your needs at reasonable cost.

VULCANIZED RUBBER AND PLASTICS COMPANY

Manufacturers of Rubber and Molders of Plastics

General Offices:
4 E. 29th Street, New York 16, N.Y.

PRODUCTION GOES UP



DOWN GO COSTS

—when you depend on the superiority of PENN RIVET'S fastenings. Every PENN fastening is a quality piece made with exacting attention to material and finish, and carefully checked against rigid specifications. Check your production costs now! Then lower them by calling on PENN for . . .

Tubular, Split and Compression Rivets • Cold-Headed Specialties • Rivet Caps • Bottom Studs.

You can Depend on PENN

PENN RIV-IT & MACHINE CO.

254 Huntington St.
PHILADELPHIA 33, PENN.

So Simple Anyone can

ENGRAVE

on Plastic and Metal

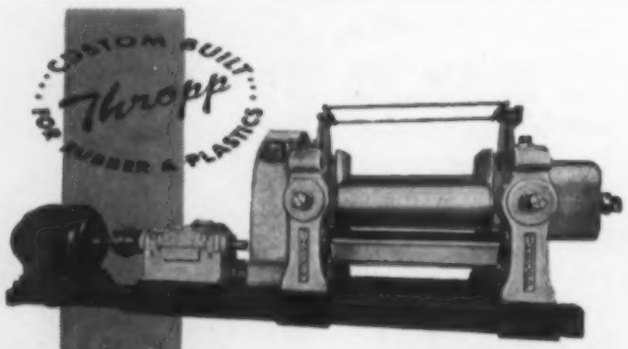
NEW HERMES PORTABLE

The handy, accurate machine that every plant NEEDS for speedy production lettering of name plates, small panels, novelties, serial numbers, part numbers, etc.

SEND FOR LITERATURE

NEW HERMES, INC.

13-19 University Place • New York 3, N. Y.



New Hi-Speed MILLS

22" & 22"x 60" Extra Heavy Duty

Extra Heavy Duty Individual Motor Driven Mill with 15" diameter journals, having 150 H.P. enclosed herringbone gear drive. Machine is equipped with solid bronze lined bearings having oil closure seals on side of the boxes facing the rolls to prevent oil contamination of the stock. Steel cut connecting gears and Johnson Rotary Joints. Manzel mechanical lubricator and new style guides bored to fit the rolls. This is just one of the many new Thropp precision built mills designed to speed up post war production.

West Coast Representative
H. M. Royal Inc.
Los Angeles, Cal.

WM. R. THROPP & SONS CO.
Trenton, N. J.

Export Agent . . . Steinhardter & Nordlinger
105 Hudson St., New York, N. Y.

Sculptured Display

A MAJOR concern for any advertiser is getting public recognition for his trademark. To this end an innovation in the field of sculptured advertising displays is the unique trademark replica of the Squirt Co., Beverly Hills, Calif., produced by the Ad Art Statuary Co., Cleveland Ohio.

Method of manufacture

The trademark replicas are made from a compound based upon a formula which involves the blending of several types of ceramic clays with a 20% mixture of special Bakelite thermosetting plastic resins. The figures are hollow cast in a manner similar to the technique employed in making chinaware and pottery. They are heat cured from 8 to 12 hr., after which they are artistically decorated with lacquer colors and finally finished with a clear gloss Vinylite coating.

High strength

The casting material, called Cerastic, has a tensile strength of over 4000 lb. p.s.i., can withstand a 2800° flash heat test, and has high resistance to moisture absorption. It is light in weight, rigid, and extremely durable.

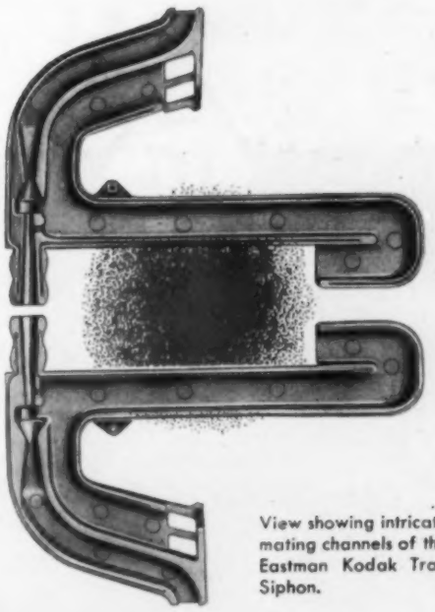
Sculptured advertising display in the form of a trademark replica is made of ceramic clays and a thermosetting resin

Quality... FROM DIES TO FINISHED MOLDED PRODUCT

CORRECT and accurate dies are the first essential for quality molded plastics. We design and make dies for Erie Resistor Custom Molded Plastics in our own plant, where expert die makers have the advantage of constant contact with design engineers, chemists, and production chiefs.

If good molded plastics require precision dies, they also demand the best raw materials, chosen with expert knowledge of their fitness to meet the requirements of the finished piece in service. And to shape those materials successfully calls for an intimate knowledge of their behavior in the molding process.

The Kodak® Tray Siphon, shown above, with its intricate convolutions of matching tongue and groove in the two halves, is an excellent illustration of a product requiring a high degree of skill at every step—from dies to finished product.



View showing intricate mating channels of the Eastman Kodak Tray Siphon.

Plastics Division
ERIE RESISTOR CORP., ERIE, PA.
LONDON, ENGLAND TORONTO, CANADA

PHENOPREG *Grades for Specialty* MOLDING AND LAMINATING

We have developed the following resin impregnated specialty grades for specific properties or applications:

PHENOPREG LP—BCM resin impregnated fiberglas fabrics for high strength molded laminates for plane parts, tools such as drill jigs, routing fixtures, etc.

PHENOPREG FIBERGLAS MAT—phenolic resin impregnated mat for molded parts having high strength, heat and abrasion resistance.

PHENOPREG RP—for plywood surfacing. A new type of resin treatment for decorative panels, wallboard, etc. Developed by our Plastics Division for low pressure lamination to plywood, various types of commercial wallboards, etc.

For further information, write

FABRICON PRODUCTS, INC.

Plastics Division

1721 Pleasant Avenue • River Rouge 18, Michigan
Vinewood 1-8200

DIEMOLDING CORPORATION

Canastota, N. Y.

TRADE DM MARK

A complete molding plant for thermosettings with an enviable record of performance established with many of the largest users of molded parts.

Call upon our engineers and designers for aid or advice in planning your molded parts.

Plastic Molders Since 1920

DIEMOLDING CORPORATION

West Coast S. P. I.

(Continued from page 86)

FM-10001 melts sharply at 263° C. (507° F.) to a liquid with a flow approximately equal to No. 20 lubricating oil. This extreme liquidity of FM-10001 nylon at molding temperature makes it necessary to provide a cutoff or other means to prevent oozing or drooling from the nozzle.

Definitely controlled molding conditions are necessary to obtain molded articles of optimum properties:

1. Temperature of the material should be from 10 to 20° F. higher than the actual melting temperature.
2. Die temperatures should range between 125 and 275° F., depending on the size, thickness, and the shape of the piece being molded.
3. A long dwell period and large sprues, runners, and gates are required for pieces of heavy cross-section in order to prevent porosity in the molded articles.
4. Injection rate should be high to prevent nylon from cooling before the mold cavity is filled.
5. On some nylon molding jobs it may be desirable to use CO_2 carbon dioxide in the injection cylinder to replace the air, which causes oxidation and in some cases slight carbonization.

Items which have been molded of nylon include gears, bushings, combs and brush backs, thread-guides, governor slide buttons, locknuts, cores for polishing brushes, valve-seats, coil forms, strain-release plugs, zippers, faucet washers, tumblers, and dishes. Many of these items must withstand sterilization, and this is an important reason for choosing nylon.

FM-3001 nylon has a lower melting point, 235° C. or 455° F., is more flexible than FM-10001. It has lower moisture absorption, which is of interest in certain electrical applications. The same techniques of molding are used as for FM-10001, except for temperatures.

Type FM-6001 nylon is a conventional thermoplastic, softening gradually over a range of temperature instead of melting abruptly. Molding temperature is approximately 180° C. or 356° F. and it can be molded by conventional injection, transfer, or compression methods. It hardens slowly in the mold, which should be cold to prevent adhesion. Die temperature should be 50 to 80° F. and a sufficiently long cycle to chill the articles is required. FM-8001 nylon is flexible and used for such items as wristwatch straps.

Many new nylons are being studied in the laboratories and possibilities for the future include a water-white transparent nylon and a nylon with a higher melting point, greater stiffness, and lower moisture-absorption than FM-10001.

DIMENSIONAL STABILITY TESTS ON INJECTION-MOLDED CELLULOSE DERIVATIVES AND SYNTHETIC PLASTICS

by W. O. Bracken, Hercules Powder Co.

THIS paper presents some of the results of a study of the performance of cellulose derivative plastics on exposure to relatively severe conditions of heat and humidity.

The tests selected for this investigation were those set up by A.S.T.M. for exposures simulating temperature and tropical zone conditions. The temperature zone test is 24-hr. exposure at 140° F. and 88% relative humidity, followed by 24 hr at 140° F. dry. Torrid zone conditions are for the same length of time at 175° F. and 100% relative humidity. *(Please turn to next page)*

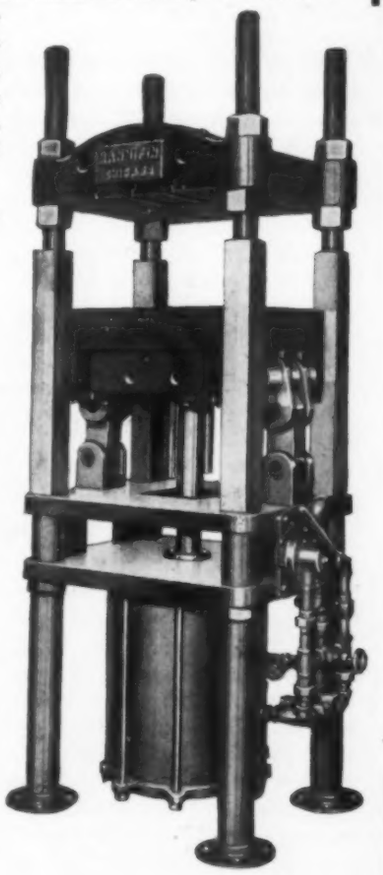
HANNIFIN

Designed and Built to help YOU solve your molding problems

• ADVANCED DESIGN. Hannifin molding press design is the product of more than thirty years of specialized experience. There is a difference. Hannifin presses—down to the last detail—are DESIGNED TO DO THE JOB!

• FASTER MOLDING. Exclusive Hannifin operating cycle for compression molding of small parts in multiple cavity molds; Rapid advance stroke . . . short power stroke at full capacity . . . rapid return stroke with full power to open molds. Operating speeds are adjustable.

• EASY TO INSTALL AND OPERATE. Small floor space needed. Connect to ordinary shop air supply at 80 to 100 lbs. pressure. Knockouts may be installed for top or bottom operation. Ideal for multiple unit installation —one man can handle as many as five presses depending on type of work.



DO YOU NEED PRESSES IN A HURRY?

DESPITE continued heavy demand for Hannifin platen presses, current delivery schedules are good. If you have to have presses in a hurry wire or write the Hannifin factory.

• Model L-207 (illustrated); 50 tons capacity.

• Model L-208; 15 tons capacity.

See your local Hannifin representative for complete specifications and information, or write HANNIFIN CORPORATION, 1101 So. Kilbourn Ave., Chicago 24, Ill.

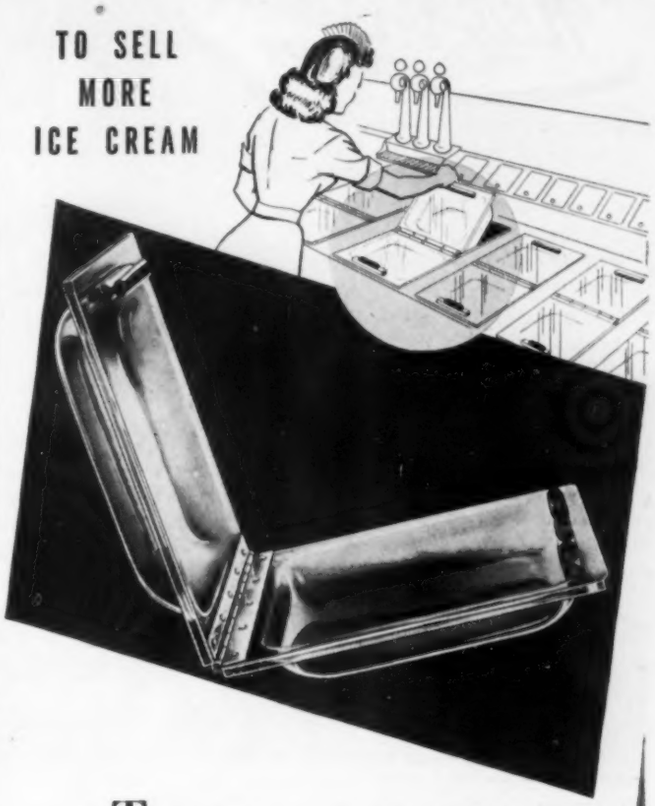
PLATEN PRESSES

K PLASTIX

DESIGNED

because Plastic does a better job

TO SELL MORE ICE CREAM



The improved "flip-flop" lid designed by K-PLASTIX for ice cream counter freezers, actually increases sales. Service is quicker because flavors are easily seen. Sales increase with a dispenser that's easily kept clean.

In use by leading West Coast Creameries

Stock models available for Kelvinator & Frigidaire cabinets.

"Serving the needs of INDUSTRY where Plastics do a better job"

ENGINEERS
FABRICATORS

K PLASTIX

580 Natoma Street
San Francisco 3, Calif.
UNderhill 1-4575

High acetyl cellulose acetate, cellulose acetate butyrate, and ethyl cellulose in two or more formulations were examined. The test pieces were selected with the view of determining the effect of size and shape of the piece upon dimensional stability.

This type of work led naturally to examination of variables such as effect of gate sizing and cycle upon stability. By opening the gates, it was quickly found out that in the case of the higher flow materials, considerable improvement was brought about.

By changing the length of cycle and rate of flow of the plastic into the mold, it was found that very substantial improvements could be obtained with regard to dimensional stability.

A comparison was made between cellulose derivative plastics and the synthetics such as the vinyl chloride-acetate copolymer, polymethylmethacrylate and polystyrene under the same exposure conditions. The more moderate or temperate zone exposure had little effect on harder cellulose acetate, the cellulose acetate butyrate, or the ethyl cellulose. The vinyl copolymer was sensitive to this exposure, as were the polystyrenes in the heavier sections. The methacrylates were good dimensionally.

There was a visual change, however, in some of these pieces which are important from a performance standpoint. There was general distortion in the vinyls, some crazing in the acrylates, and widespread crazing in the polystyrene pieces with the exception of the disks.

The next series of tests involved exposing these pieces for 24 hr. at 175° F. and 100% relative humidity, followed by 24 hr. at 175° F. dry. In the cellulosics, only the H4 ethyl cellulose exhibited less than 1% dimensional change. It is of interest to note how the high acetyl cellulose acetate and cellulose acetate butyrate show comparable results. The vinyl copolymer distorted badly. The hardest polystyrene and the harder acrylate were comparable to each other and in turn showed the same order of dimensional stability as did the H4 ethyl cellulose from the physical measurement standpoint. From the appearance standpoint, however, the synthetics showed crazing, cloudiness, or reproduction of the screen support. The ethyl cellulose showed no such effects.

SYNTHETIC RESINS IN RUBBERS

by Leonard Boller, U. S. Research & Development Co.

IN THE past several years many rubber and synthetic rubber products have been made with resins incorporated in them. The butadiene-acrylonitrile copolymer rubbers have been widely used to blend with vinyls, phenols, resorcinols, and other resins. It has become common practice to make hard and semi-hard rubbers by using phenolic resin-nitrile blends.

If we take a certain well-known phenolic blend with a melting point of 70 to 75° C. and cure it alone, it may become a hard, inflexible, heat resisting material. Blending nitrile rubbers with this phenolic will give us a rubber-plastic material. As the amount of phenolic is increased, the hardness and tensile strength increases. The elongation and compression set become poorer. It may be broadly stated that if the rubber content is over 50% of the blend, the resultant vulcanizate will be somewhat rubbery or leathery. If the phenolic content is over 50% of the blend, the vulcanizate will be short and very hard, but the impact strength is greatly improved over the straight phenolic. Transfer molding works nicely with these blends for specific applications.

Considerable work has been done on the plasticizing

Attention Fabricators!

SWEDLOW PLASTICS CO.
takes pleasure in presenting PYLON PF
RADICALLY NEW POST-FORMING LAMINATE
compound curvatures • maximum draw

The resins used in producing PLYON PF* have been developed to allow the maximum draw of the filler material in the post-forming of compound curvatures. In other words, for the first time a post-forming resin is available that will MOVE WITH the fabric filler, permitting the full required compression as well as expansion of the resin without the usual surface cracking.

Neither excessive heat or pressure is required in the forming operation. For example: a one-minute heating cycle at 325° F. and pressure not more than 25 pounds per square inch is adequate for PLYON PF66, even when making relatively deep draws.

Complicated shapes can be made with simple, inexpensive tooling, such as matched male and female dies or combinations of female ring with male plug. Each with proper restraining pressure rings to prevent wrinkling during the drawing operation.

We invite you to test PLYON PF and we will supply a sample of sufficient size for that purpose. Also, our engineering group is qualified to assist you with any problems which may arise in the development of your applications.

Although our present production is of Fiberglas this material is available in cotton, glass or all cotton combinations.

FOR IMMEDIATE DELIVERY

Code	Filler	Thickness
PF55	2 ply 128 Fiberglas	.015"
PF66	2 ply 162 Fiberglas	.040"
PF666	3 ply 162 Fiberglas	.060"
PF6666	4 ply 162 Fiberglas	.070"

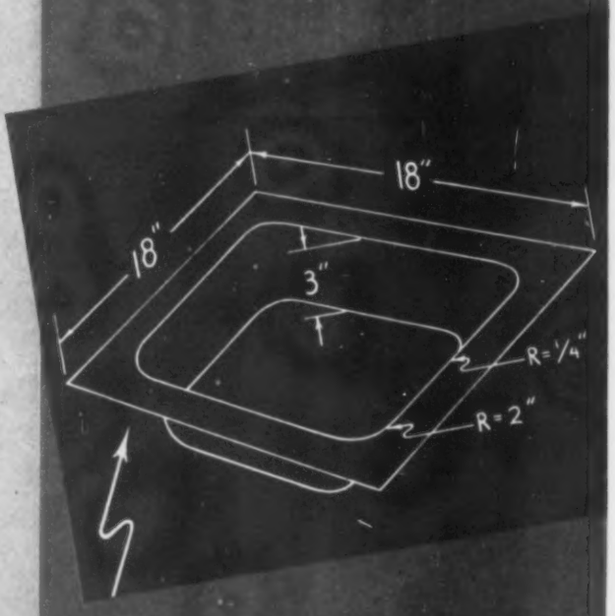
*Reg. U.S. Pat. Off.

SPECIAL FEATURES

PLYON PF possesses a unique versatility uncommon to other post-forming laminates.

Solid colors both translucent and opaque, plain and multiple color designs are all within the wide latitude of our manufacturing process.

Therefore, PLYON PF is not restricted to industrial applications alone but may be used for decorative purposes as well.



Material data: PLYON PF66
Forming data: 325° F one min.
Tooling: Male and female die

Swedlow PLASTICS CO.

3757 Wilshire Boulevard • Los Angeles 5, Calif.

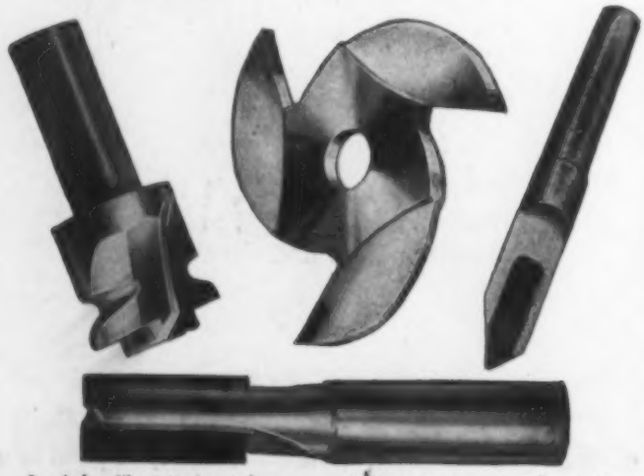
Export distributor:
OMNI PRODUCTS CORP., 460 FOURTH AVENUE, NEW YORK 16, NEW YORK

Experience
••• KEEPS RECTO
ON TOP IN PLASTICS

® RECTO MOLDED PRODUCTS INC.
CINCINNATI 9 OHIO
MELROSE 6862
DETROIT L. S. HOUSE
5-267 GENERAL MOTORS BLDG. MADISON 2781

SLASH TOOL COSTS
SPEED PRODUCTION
WITH
CARBIDE-TIPPED TOOLS

VELEPEC CARBIDE-TIPPED engraving cutters, end mills, counterbores, countersinks, routing cutters, etc., stay sharp 10 to 30 times longer than regular steel tools. They stay sharper . . . cut cleaner and quicker . . . effect tremendous savings in machine "reset" time.



Send for illustrated catalog or quotations on your requirements.

FRED M. VELEPEC CO.
71-11 64th STREET GLENDALE, L. I., N. Y.

of phenol-formaldehyde resins with Thiokol LP-3. Ten to 20% of LP-3 in phenol thermosetting varnishes has greatly improved the ability of the varnish to withstand bending. Higher amounts of LP-3—that is, 30 to 40% —give more rubbery products, a softer tougher film. LP-3 in pheno-formaldehyde varnishes allows thicker sections to be baked at one time without blistering. It is possible to thin the resin and Thiokol LP-3 with solvents, thus opening up a large field in proofed and dipped solvent resistant fabrics, fibers, and leathers.

Great strides are being made using vinyl chloride-nitrile rubber blends. The nitrile rubber acts as an unextractable plasticizer for the polyvinyl chloride copolymers.

The substitution of a nitrile rubber for a plasticizer such as dioctyl phthalate may result in a slight lowering of the tensile, modulus, and tear values. However, abrasion may go up, and better aging can be accomplished.

There are also uses for the butadiene-styrene copolymers. Several manufacturers have made resins of high styrene content. High styrene copolymers resemble plastic resins and are very hard and brittle. The chief advantage of these copolymers to the rubber industry is that they are very compatible with GR-S and natural rubber. It is possible to make compounds of almost any hardness without difficulty. In order to reduce the thermoplasticity of the compound it is advisable to incorporate vulcanization agents when less than 50 parts of resin is used on 100 parts of rubber or 100 parts of GR-S.

These butadiene-styrene resins are being used in golf ball covers, rubber floor tiling, shoe soles and uppers, and chemical-resisting tubes, pipes, and fittings.

A new styrene isobutylene copolymer series known as 'S' polymers has been recently introduced. The good processibility and low vapor transmission of the 'S' polymers make them attractive as packaging materials for non-oily foods. Their use in rubbers at present is just as a processing aid.

THE BEHAVIOR OF SOME ALKYL HYDROPEROXIDES AND PERESTERS IN POLYESTER RESINS

by Reginald P. Perry and Kenneth P. Seltzer,
Union Bay State Chemical Co., Inc.

THE increasing use of polyester resins in laminating and casting operations has resulted in the widespread application of alkyl hydroperoxides and peresters or catalysts in these resins. At the moment, interest centers around 60% t-butyl hydroperoxide, t-butyl perbenzoate and l-hydroxy cyclohexyl hydroperoxide-1, and these have become established as recommended catalysts in many instances. They are found to produce more rapid cures with lower exotherm and better physical properties than has been possible heretofore, with the limited number of catalysts available.

Because of wide variation in composition and reactivity of the proprietary resins, selection of the most suitable of these peroxides for any particular resin becomes largely a matter of individual evaluation.

Exotherm data is shown demonstrating that: 1) the relative efficiency of one catalyst against another under identical conditions is a function of resin composition; 2) based on an analysis of initial gel-time and exotherm data, the wide range of properties found in these peroxides provides the fabricator with a greater measure of control over the heat build-up and resulting resin properties; 3) reaction rates and temperatures are a function of peroxide concentration and initiating tempera-

alanol* EXTRUSIONS

WEAR BETTER

LOOK BETTER

*T.M. Reg.
Pat. pend. U.S. Pat. Off.

ALANOL wears *better* because, by modifying its special polyvinyl formula, we're able to give it the *exact* properties you ask for. You can specify ALANOL, for example, that's perspiration and mildew-proof . . . that's impervious to acids, alkalis, solvents and oils . . . that possesses special fatigue, abrasion and impact resistance . . . that's unaffected by continuous flexing.

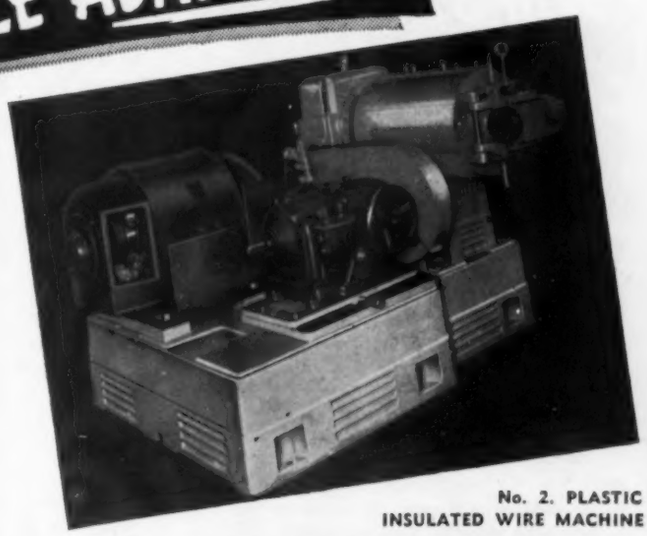
And ALANOL looks better because, thanks to our exclusive "Color Control Process," its colors are pure, beautiful and fade-proof. Moreover, our process enables us to match your sample with utmost accuracy in brilliance, hue and tonality—a feature of special importance if you're using extrusions for shoes, belts, decorative trim, furniture and the like.

Alan *Plastics Corp.*

ALANOL is now available in any cross-section, any quantity and any color. Ask for details.

120 South 20th Street Irvington, N. J.

RUGGED-DEPENDABLE-ADAPTABLE



No. 2. PLASTIC INSULATED WIRE MACHINE

ROYLE PRODUCTS

Continuous Extruding Machines for the Rubber, Plastic and Chemical Industries
Continuous Vulcanizing Machines for Rubber Insulated Wire
Plastic Insulated Wire Machines
Light Wire and Cable Capstans
Strainers **Motorized Take-Ups**
Cooling Troughs **Temperature Control Units**

JOHN ROYLE & SONS

ROYLE PATERSON N. J.

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN 1880

London, England
James Day (Machinery) Ltd.
REgent 2430

Home Office
E. B. Trout J. W. VanRiper
SHerwood 2-8262

Akron, Ohio
J. C. Clinefelter
JEfferson 3264

Los Angeles, Cal.
H. M. Royal, Inc.
LOgan 3261

PATERSON 3, NEW JERSEY

BETTER
Flexible
METAL HOSE
FOR EVERY PURPOSE

• SEAMLESS—Constructed from one continuous piece of uniform thickness • PARALLEL CORRUGATION assures maximum strength and flexibility • SPECIAL ALLOYS can provide either heat or acid resistance • AVAILABLE in wide variety of types to convey all kinds of liquids and gases • AVAILABLE in special assemblies to meet your special requirements.

White Eclipse-Pioneer for information.

ECLIPSE-PIONEER Division of Bendix AVIATION CORPORATION
TETERBORO, NEW JERSEY

Don't risk a large investment on a new product that may not sell. Kirk's new Short Run Shop is the economical way to pre-test the salability of a new product. The Short Run Shop will supply 100 to 5000 precision-made samples of your product. Prices as low as $400 for 1000 samples including mold.

If your "baby" proves salable . . . fill your volume requirements economically in our regular production plant.

Send blueprint, drawing or sample for quotation within ten days. Your copy of "Short Runs of Injection Molded Plastics" sent upon request.

"The short run is best in the long run".

KM F. J. KIRK MOLDING CO.
104 Brook St. Clinton, Mass.

ture and are specific for given resins and peroxides; 4) promoter systems may be used to speed the reaction at lower catalyst concentrations; however, in some systems, certain promoters may produce a retarding effect upon catalysis; and 5) mixtures of peroxides in so-called trigger systems make it possible to use those peroxides which give desirable resin properties but do not normally provide sufficiently rapid reaction rates.

As a result of further research and evaluation, better lower cost catalysts can be made available to the plastics fabricators as well as the resin manufacturer.

PRACTICAL APPLICATION OF THE THEORETICAL ASPECTS OF THE CLOSED MOLD METHOD OF MOLDING THERMOSETTING MATERIALS

by C. A. Norris, assistant general sales manager, Bakelite Corp.

IN producing molded parts from thermosetting molding materials, two basic methods are employed. In compression molding, the charge of molding material is placed directly in the mold cavity, and then the heated mold is closed under pressure on the material. In the second method, the empty mold is first closed and then the material is forced from a pressure chamber, in a plastic state, into the cavities of the closed mold. A substantial percentage of the phenolic molding material used in the United States is processed by the closed mold method.

Some of the factors that have been responsible for this expanded use are:

1. The issuing of licenses to operate under patents assigned to the Shaw Insulator Co.
2. The development of improved methods of preheating, particularly the introduction of high-frequency "heatronic" method of preheating as applied to thermosetting materials.
3. The demand during the last war to produce necessary plastic components at top production levels.
4. The modernization and application of the opposing ram press to the closed mold method of molding.

Certain fundamental principles must be observed if maximum efficiency is to be obtained with this method of molding. Proper design of cavities, runners, gates, and vents are of paramount importance. It is advisable to have the knock-out pins on that half of the mold which is opposite to the pressure chamber. It is essential that the mold be adequately supported directly under the pressure chamber to insure against distortion or sagging of the mold at this point when pressure is applied. It is generally advantageous to place the cavities in a circular position around the pressure chamber. The proper location of the gate is dependent, for the most part, upon the size and shape of the part in question.

In selecting a thermosetting material for this type of molding, properties such as flow, set-time, thermal conductivity, and dielectric characteristics must be considered. The ideal molding material would soften rapidly when subjected to heat and pressure without at any time becoming very fluid.

It is extremely important that the total clamping pressure, holding the mold closed, is always greater than the pressure exerted within the cavities and runners acting to force the mold open. Each molding job should be carefully analyzed, and pressures calculated to make sure this condition exists, allowing an added 15% safety factor to insure adequate clamping action.

Careful control of optimum heatronic preheating and the maintenance of uniform mold temperatures must be established. (*Please turn to next page*)

Now, the LARGEST PLASTIC SHEETS ever made!

super-size *Plexiglas* sheets

100" x 120"

Surface area more than 83 square feet...
Many times larger than rigid plastic sheets of any other type...
More than twice as big as any cast acrylic sheet formerly available...
Thickness ranges from .250" to .500"...

Now Available for Commercial Uses

Originally developed for the U. S. Army Air Force, super-size PLEXIGLAS sheets now are widening the scope of design in many fields—permitting large-dimension applications formerly restricted to other materials.

Simplifies Large-area Fabricating

Light, durable, shatter-resistant, optically clear and easily worked, PLEXIGLAS is well suited to a host of plastics products and components. And in its new large dimensions, this rugged acrylic resin is now practical for such unusual applications as curved transparent tops for automobiles, large one-piece show-cases, huge "spectaculars" and other advertising signs, as well as architectural uses—facades, wall facings, partitions, curved glazing.

PLEXIGLAS and Your Product

How will *you* use super-size PLEXIGLAS? The answer depends on your plans—and imagination. If you employ plastics in large-area fabrications, super-size PLEXIGLAS may be the means of cutting production time, thus more than offsetting the slightly higher price of these giant sheets.

Investigate Super-size PLEXIGLAS Now

At present, super-size PLEXIGLAS sheets are available in limited quantities. But with expanded production on the way, you'll soon be able to obtain all you want. For full information, write us today.

Plastics "Firsts" by ROHM & HAAS

FIRST to make acrylic resin sheets in the United States.
FIRST to make acrylic resin sheets larger than 40" x 50".
FIRST to make acrylic resin sheets up to 3" thick.
FIRST to make acrylic resin sheets 100" x 120".

PLEXIGLAS *is a trade-mark, Reg. U.S. Pat. Off.* PLEXIGLAS acrylic resin sheets, rods, and molding powders are manufactured only by Rohm & Haas Company.

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Manufacturers of Chemicals including Plastics • Synthetic Insecticides • Fungicides • Enzymes • Detergents • Germicides • Chemicals for the Leather, Textile, Ceramic, Rubber, Paper, Petroleum and other Industries

HASSALL cold-heading may solve your immediate special part problem...Special nails, rivets and threaded parts made in diameters from 1/32" to 3/8"—lengths up to 7"...Rivets 3/32" diameter and smaller a specialty...Variety of metals, finishes and secondary operations...Economy, quality and quick delivery in large or small quantities...Tell us what you need...We will answer promptly. **ASK FOR FREE CATALOG.** 3-color Decimal Equivalents Wall Chart free on request.

JOHN HASSALL, INC. 396 Oakland St. Brooklyn 22, N.Y.

Manufacturers of Cold-Headed Specialties—Established 1850

1. PLASTEX Continuous Spooler

The amazing self adjusting unit especially designed for spooling monofilament directly from the extruder.

2. COIL-ON

The flat strip take-up and reeler unit. Ideal for rapid handling of all types of flat extruded plastics - any thickness to 4" in width. The 2 in 1 complete unit you have been awaiting.

Write today
For complete information

PLASTEX MACHINE CORP.
PATERSON 27, NEW JERSEY

Pressure chamber must be of adequate size for charge of molding material. The "Plunger Pressure and Preform Ratio Chart" prepared by D. M. Buchanan is very helpful in determining the diameter of preform and pressure chamber depth to be used with wood flour filled materials.

POLYESTER RESINS

by E. L. Kropa, American Cyanamid Co.

THE polyester resins, developed during the war, are now entering into peace-time applications. The term polyester resin was adopted partially for reasons of secrecy, and the term thermosetting vinyl polymer is now considered preferable.

All known resins fall into four general classes: thermoplastic condensation materials, thermoplastic polymerization types of resins, thermosetting condensation resins, and thermosetting polymerization resins. The polyester resin fits into the fourth, hitherto neglected, class. It is generally known that any product possessing two vinyl groups in the same molecule is capable of forming a thermosetting polymerization product.

Resinous materials can also be classified into those which are amorphous and those which are crystalline. Through suitable choice of ingredients, both amorphous and crystalline polyesters can be prepared.

Certain parallels can be shown between the curing of rubber and the polyester resins.

Testing Plastics

(*Continued from page* 94)

erty. There is every indication that one of the most important results of the work with this machine will be a definite reduction in the number of test methods employed. This in itself will greatly decrease the test work which is now required and will probably reduce laboratory budgets necessary for this type of work.

3. The third aim, which while theoretical is still definitely of a practical nature, is the opportunity for obtaining more accurate property values. When such values have been obtained and have been proved practical, it is reasonable to assume that present methods of material selection and engineering design of plastic parts will be substantially improved. It is well known today that although much engineering is done on a basis of material test values, there is justifiably a great deal of skepticism as to their engineering significance. This results in many parts being tested under conditions of actual usage before the design and material are considered satisfactory. With more accurate values available to the engineering designers in the plastics field, much time will be saved and better products will result through their use.

4. The fourth aim of this project can be classified as a long-range program in pure research. It is, however, directly tied in with the other three aims; as is well known, many important scientific discoveries

in the past have been largely accidental. As the work progresses on the practical and semi-practical objectives, there is always a possibility that some discovery will completely change the plastics industry. It may even go so far as to stimulate and guide the development of plastic materials unknown today. It will certainly result in better plastics.

Volatile Loss

(*Continued from page* 127)

compound in the mold became unsatisfactory with a longer preheat. A molding time of 2½ min. at 320° F. was required to produce satisfactory cure as determined from water absorption tests. Hence, a volatile loss of 2% was about the minimum that could be obtained for satisfactory cure at a molding temperature of 320° F.

When molding at 380° F. it was not possible to mold a specimen without preheat, but it was possible to preheat the preform for an hour before unsatisfactory flow occurred. With a molding time of ½ min. at 380° F. the volatile loss was reduced from 3.72% with a preheat of 1 min., to 1.37% with a preheat of 1 hour. A molding time of ½ min. at 380° F. produced a cure comparable to 2½ min. at 320° F. Hence, for comparable curing a lower volatile loss was possible at the higher molding temperature because of the longer time of preheat that could be used. The volatile loss was reduced steadily from 3.72 to 1.52%, or a reduction of 2.2%, as the preheating time was increased from 1 to 25 minutes. An additional preheating time of 35 min. reduced the volatile loss from 1.52 to 1.37% or a reduction of only 0.15 percent. In other words the volatile loss in the molded specimen approached a constant value somewhat less than 1.37% as the preheating time was increased. This change in degree of reduction

Table 1.—Loss in Weight of Bottle Caps Dried at 221° F. in a Forced-draft Oven for 250 hr. When Preheated and Molded under Different Conditions

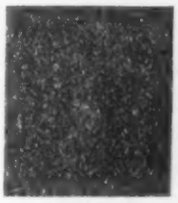
Time of preheat at 221° F.	*Molding time*	*Loss in weight when molded*	
		at 320° F.	*at 380° F.*
Min.	*Min.*	*%*	*%*
0	2½	3.95	
10	½	1.75	2.38
10	1		2.47
10	2		2.80
10	2½	2.05	2.90
10	5	2.13	3.23
10	10		3.62
1	½		3.72
5	½		3.00
10	½		2.38
13	½		2.00
17	½		1.76
25	½		1.52
60	½		1.37

STABELAN
after 1100 hrs. UV exposure. RESULT—retains flexibility with only slight change and discoloration.

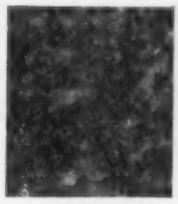
Results Count!

Comparison of STABELAN

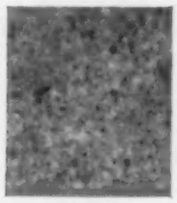
with other commonly used stabilizers in Vinyl Films exposed in Miami, Florida ... South Florida Testing Service.



TYPE "A" STABILIZER
after 300 hrs. UV exposure. RESULT—cracked and brittle, completely decomposed, black and badly discolored.



TYPE "B" STABILIZER
after 400 hrs. UV exposure. RESULT—badly cracked and brittle, turned black, discolored.



TYPE "C" STABILIZER
after 400 hrs. UV exposure. RESULT—stiffened, brittle and discolored

STABELAN SUPERIORITY

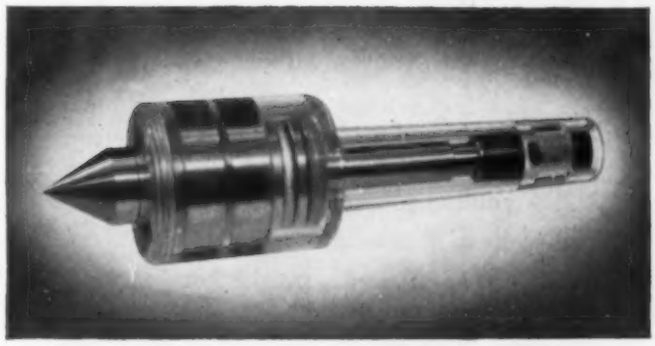
proved by tests. Flex it ... Expose it ... Compare it ... Don't spare it.

Additional details on request.

STABELAN CHEMICAL CO.

P.O. Box 665 Toledo 1, Ohio

INCREASE SALES...

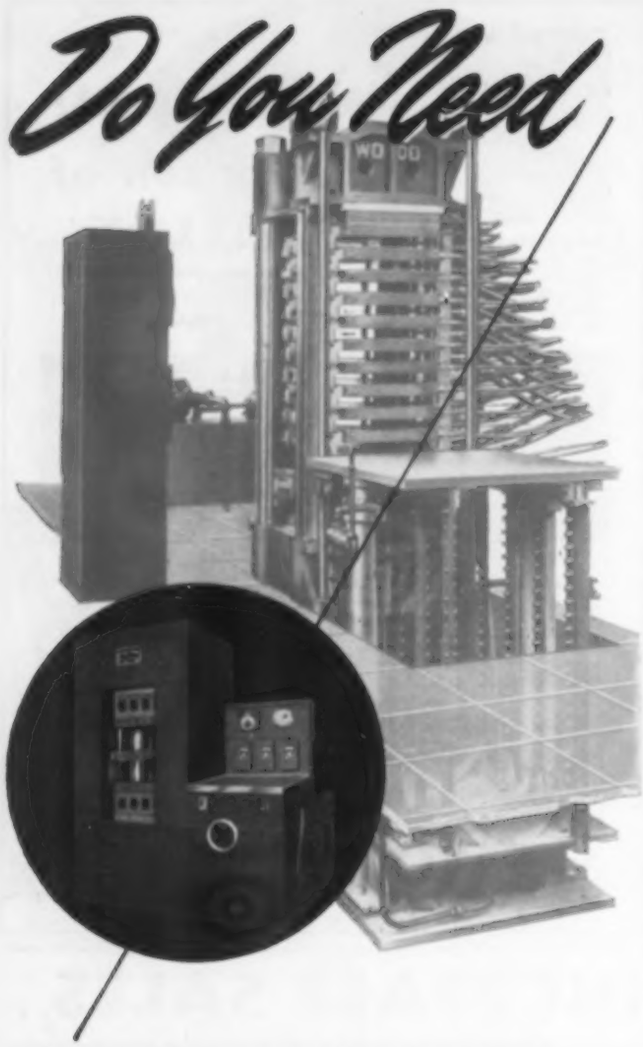


The TRANSPARENT WAY

- Transparent plastic housings or models, same size or scaled proportionally ... present the inner workings of your product ... have eye-appeal.
- Over 25 years experience guarantee you engineering skill and mechanical accuracy. Send us *your* problem. It will receive *prompt, confidential attention.*

We also furnish
COMPRESSION AND INJECTION MOLDS

STRICKER-BRUNHUBER CORP.
Mechanical Developers
19 WEST 24th ST. SB NEW YORK 10, N. Y.
WAtkins 9-0191



Extremely accurate, multi-opening steam platen presses, with or without elevator equipment?

Rugged, semi-automatic molding presses with hydraulic strippers?

Angle molding presses?

Matrix-curing, or laboratory presses?

Usually R. D. Wood Hydraulic Presses can fill your need and help you do a better job, more economically. Let the R. D. Wood engineers provide you with the answers.

There are many standard presses available, and special presses can be developed to fit most requirements. Don't forget, R. D. Wood Presses assure even heat distribution, positive guiding, great rigidity and uniform pressure distribution. And, too, there is more information about Wood Presses awaiting your request.

HYDRAULIC PRESSES AND VALVES FOR EVERY PURPOSE
ACCUMULATORS • ALLEVIATORS • INTENSIFIERS

R. D. Wood Company

Est. 1803 PUBLIC LEDGER BUILDING, PHILADELPHIA 5, PA.

of volatile loss for a given amount of preheat that occurred at the end of a 25-min. preheat corresponds to a similar change in the volatile loss of the preforms after a 25-min. heating as shown in Table II.

It is not possible from these data to determine the proportion of volatile loss that may be the result of residual volatile matter in the powder and the portion that may be produced during the molding operation, because the volatile loss of the preforms as shown in Table II is also composed of adsorbed moisture and moisture resulting from slow condensation of the resin. However, 1.37% volatile matter appears to be the minimum that can be obtained for this compound by preheating in a convection oven.

Effect of time and temperature of molding

Increasing the time of molding for a given temperature or increasing the temperature for a given time of molding caused an increase in volatile loss of molded specimens. At a molding temperature of 320° F. and a preheating time of 10 min., the volatile loss increased from 1.75% for a ½-min. molding to 2.13% for a 5-min. molding, or an increase of 0.38 percent. At a molding temperature of 380° F. and the same conditions of preheat and time of molding, the volatile loss increased from 2.38 to 3.23%, or an increase of 0.85 percent. Although the higher temperature of molding produced higher volatile losses for a given time of molding, it was possible to obtain lower volatile losses at the higher temperature because of the combination of the shorter time of molding required for cure and the greater length of preheating time that could be used.

Table II.—Volatile Loss from Preforms after Heating for Different Lengths of Time at a Temperature of 221° F. in a Convection Oven

Time of heating[a]	*Volatile loss*
	%
10 min.	3.0
20 min.	3.9
30 min.	4.1
45 min.	4.3
1 hr.	4.5
2 hr.	4.7
4 hr.	5.0
19 hr.	5.49
25 hr.	5.54

[a] Heated in a convection oven for 4 hr. and in a forcer-draft oven from 4 to 25 hours.

Cotton Fabric Laminates

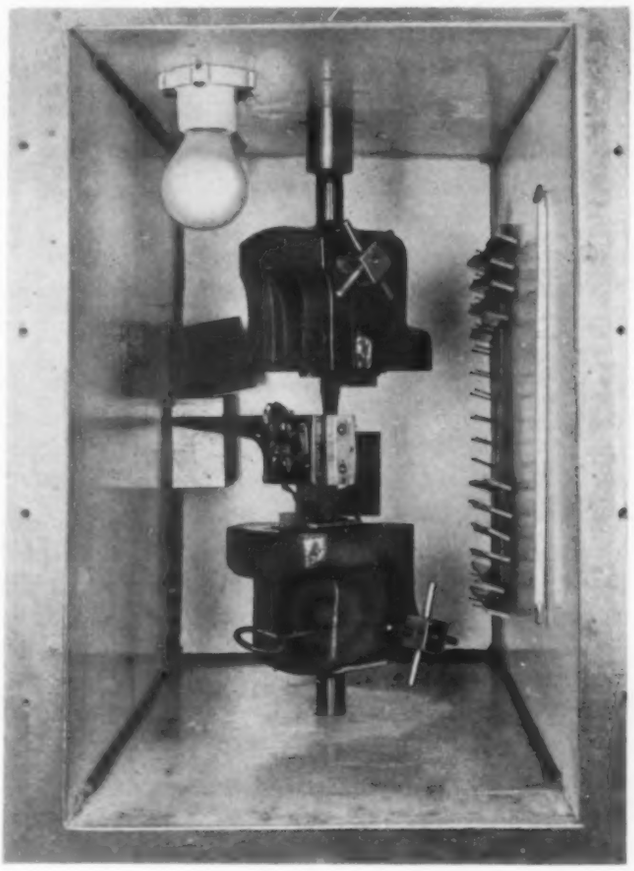
(*Continued from page* 125)

either the solenoid of the extensometer at low temperatures or the solenoid of the recorder at high temperatures. Values for the ultimate strength in tension, elongation in 2 in. and modulus of elasticity in tension for the two grades are given in Table I.

Figure 4 shows the fixtures used in flexural strength tests. The flexure autographic stress-strain equipment used in these tests recorded the motion of the two portions of the jig shown, without recording the motion of the weighing head of the system. Values are given in Table I for the maximum fiber stress and modulus of elasticity in flexure.

Bearing strength

In this test the sample specified in L-P-406 is used with a 0.125-in. hole drilled in the sample at an edge distance of five times the diameter. Since the specifications require the bearing strength to be determined at 4% deformation of the hole it was necessary to construct a special extensometer of high magnification for this work. Values for the bearing strength determined at 4% deformation of the hole,



2 — A tensile specimen in position for test in the controlled temperature cabinet

as well as values for the ultimate bearing strength of the material under the test conditions, are reported in Table I. Since the deformation measured at 4% is only 0.005 in., the accuracy of this test as compared with other tests must be taken into consideration.

Shear strength

The Johnson double-shear jig shown in L-P-406 was found to be unsuited for production testing in a

GLADITE

WONDER PLASTIC OF 1958

...HERE 10 YEARS AHEAD OF TIME

COLD-MOLDING in COLORS

LEADING MOLDERS USE GLADITE FOR ITEMS LIKE THESE

Checkers of GLADITE have smooth, lustrous finish that's colorfast and highly resistant to abrasion and chipping.

Strong GLADITE bottle caps withstand high torques. . . are proof against water, greases, oils, alcohols.

Good dielectric properties, heat resistance (over 700°F) and arc resistance (480 seconds) distinguish GLADITE electrical components.

Model building block of non-toxic GLADITE has high compression strength, dimensional stability, resists scratching and chipping.

Gladite* is the revolutionary new cold-molding powder that can be molded into finished plastic parts at speeds as high as 30,000 small units per press per hour. Only one operation is involved: the single rapid stroke of a molding press. No preheating, pre-forming or after-baking steps are necessary.

Gladite flows easily. Its bulk factor is unusually low. It can be obtained in *any color* . . . each of them fast, each uniform.

Moreover, the physical properties of Gladite can be varied by formula. It can be provided with specific dielectric properties, or compounded to withstand temperatures over 700° F. All formulations have excellent dimensional stability plus exceptional compression and tensile strength.

And every finished item molded of non-toxic Gladite has a smooth lustrous surface that needs no buffing, grinding or polishing!

If you'd like to test Gladite on your equipment (either rotary, single-stroke or hydraulic presses) or investigate its utility for new applications, write now on your business letterhead for a free sample canister.

Standard shipping container for GLADITE is this sturdy 100 lb. fibre drum.

*Reg. U.S. Pat. Off.

MYLER PLASTICS CORPORATION

Cold Mold Plastic Powders

92 BISHOP STREET JERSEY CITY 4, N. J.

HIGHER PRESSURES
with
LESS TROUBLE

ATLAS Type "E"
High Pressure Reducing Valve

Plastics plant operators are finding that they can now reduce much higher pressures—up to and including 6,000 lb. per sq. in.—and at the same time with much less trouble. In fact, usually with no trouble at all. How? By means of the remarkable ATLAS Type "E" valve shown at the right. They also find that it handles air, water, or oil, with equal ease — *without shock.*

What's the Reason?

Because it is made by a concern that has been in the regulating valve business *exclusively* for nearly a half century. ATLAS has the "know-how". The body of the valve, for example, is entirely of forged steel. All internal metal parts are of stainless steel. A formed packing of special material superior to leather is used which is immune to all fluids commonly used in hydraulic machinery. The pressure on the seat is balanced by a piston with the result that variations in high initial pressure have little effect on the reduced pressure. Be sure to ask for complete data.

For other ATLAS plastics plant products see the partial list in our ad in the January 1948 issue of MODERN PLASTICS

ATLAS VALVE COMPANY
REGULATING VALVES FOR EVERY SERVICE
277 South Street, Newark 5, N. J.
Represented in Principal Cities

CONTRACT
PLASTICS
MOLDING
INJECTION AND COMPRESSION MOLDING IN ALL
THERMOPLASTIC AND THERMOSETTING MATERIALS

We have the set-up and experience to give you the best in plastics molding of small and large parts, in small or large quantities, at reasonable prices.

QUOTATIONS on specific requirements without obligation

S.S.WHITE PLASTICS DIVISION
THE S. S. WHITE DENTAL MFG. CO.
DEPT. M, 10 EAST 40th ST., NEW YORK 16, N. Y.
FLEXIBLE SHAFTS • FLEXIBLE SHAFT TOOLS • AIRCRAFT ACCESSORIES
SMALL CUTTING AND GRINDING TOOLS • SPECIAL FORMULA DUSTERS
MOLDED DENTURES • PLASTIC SPECIALTIES • CONTRACT PLASTICS MOLDING

temperature cabinet, and was therefore modified as shown in Fig. 5. The six nuts which clamp the 1 by 4-in. steel bars down on the specimen were replaced by quick acting eccentric cams and levers. The bars were counterbored from beneath and springs inserted so that the jig opens itself when the levers are raised. Wedge-nosed bars of suitable thickness and having a ring handle are inserted from each side of the jig after a sample has been broken so that all parts of the jig floor are at the same level. The new specimen on entering pushes out the broken fragments of the old specimen. A shallow channel in the two outer 1 by 4-in. steel bars guides the new specimen into place even though the operator working in a temperature cabinet can see only the front of the jig. This modification also makes certain that the sides of the sample are perpendicular to the shearing edges of the tool. A strong steel cage was constructed to hold the shear jig in such a way that the tension test range of the testing machine could be used since the lowest compression range of the machine was too large to give accurate readings for the specimen sizes used.

The following specimen dimensions were used in these tests:

Thickness of sheet tested	*Direction of shearload*	*Specimen size*		
		depth	*width*	*length*
in.		*in.*	*in.*	*in.*
½	Flatwise	¼	½	3
½	Edgewise	⅛	½	3
⅛	Flatwise	⅛	½	3
⅛	Edgewise	⅛	⅛	3

The ¼-in. deep specimen was used in the one case because it was felt that under these conditions it would fail in shear at a load much less than that required for failure in compression. The ¼-in. specimens were prepared by machining ½-in. thick material to the required thickness. All machining in this case was done from one face of the material. The ultimate shear strengths are reported in Table I.

Flexural fatigue strength

Six Krause type flexural fatigue machines were installed and operated as recommended by the Naval Air Experimental Station at the Philadelphia Navy Yard in order to obtain constant stress data. At frequent intervals throughout the test, which may last for several days, the machine is stopped and the specimen deflection measured under a known static load. The eccentric is then set to give the same deflection and the test resumed. During the time required to reset the eccentric there is a change in the temperature of the sample and a corresponding change in the flexural properties of the material. For this reason all adjustments must be made as rapidly as possible. In order to measure accurately the specimen deflection under a static load and to reset the eccentric to give the same deflection in

3 — Front of controlled temperature cabinet with electrically heated gloves for tests at —70° F.

a minimum time, a device was made which incorporates a dial micrometer, electrical contacts to indicate when the pointer contacts the micrometer without applying sufficient pressure to change the deflection, and suitable mounting pins to allow the device to be used on all six machines interchangeably. It was also necessary to construct a set of milling fixtures so that all cuts on the specimen could be made in a vertical or horizontal plane. With this set of fixtures the complex Krause type specimen could be machined in sets of six in a minimum amount of time. A further advantage of the fixture was a number of accurately located reference points to aid the machinist in producing specimens with a minimum variation in dimensions.

In these tests the specimen is assumed to have failed when the deflection under static load shows a rapid increase. A number of specimens are run at various stresses in order to obtain points on a curve of maximum fiber stress plotted against the number of cycles to cause failure. The stress at which this curve intersects the 10,000,000 cycle line is the value reported. All tests were run at 1725 cycles per minute. It was found that when both the stress and the number of cycles are plotted logarithmically the curve is relatively flat, which simplifies the estimation of future points as the series of tests progresses.

Since fatigue testing is a time consuming operation the most representative materials of the two grades were chosen and the values obtained are given in

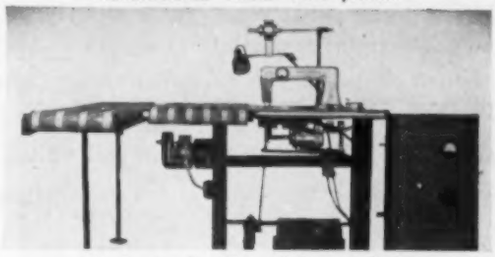
MAYFLOWER H.F.

DIELECTRIC HEATING EQUIPMENT

Generators of 500-1000-2500-5000 watts and 15 kilowatts at frequencies best suited to furnishing a basic source of radio frequency heat for average applications.

ELECTRONIC SEWING MACHINE

Manufactured under RCA patents



Continuous bonding of Thermoplastic Sheeting from .004" to .040" Thick at Speeds up to 35 feet per minute

BAR SEALERS INDIVIDUALLY ENGINEERED FOR YOUR PARTICULAR REQUIREMENTS

Our engineers make a complete analysis of every application where electronic heat is required in a plant and fit the equipment to "overall" requirements and not a single job.

SUBMIT YOUR PROBLEMS FOR SPECIFIC RECOMMENDATIONS

Mayflower Electronic Devices, Inc.

A DIVISION OF MAYFLOWER MACHINE AND TOOL CO.

6014 Hudson Boulevard West New York, N. J.

Union 3-7100

STAINLESS STEEL

CASTINGS

give FASTER production

because:

Cast Mold Components can be made in less time.

Little finishing is required — the mold is accurate.

give BETTER production

because:

The Stainless, mirror-like finish saves much powder — many rejects.

Compressive strength is 20% greater than tool steel.

Stainless Steel components are corrosion proof.

Write for Complete Data

Elmer C. Maywald

& COMPANY Inc., 189 W. Madison St., Chicago 2, Illinois

Sub Agents for: Michigan, Indiana, Illinois, Wisconsin, Iowa

NOW!

REZ-N-BOND

REZ-N-BOND is a water-white bonding agent of remarkable physical properties for bonding Lucite, Plexiglas and all other acrylics. Applied by brush or dropper, REZ-N-BOND sets *instantly* and produces perfect, optically clear junctions. REZ-N-BOND is available in colors and also in viscous form for laminating large flat surfaces.

Both forms are non-inflammable and can be stored indefinitely without deterioration or hardening.

Write today for prices and descriptive folders.

Schwartz CHEMICAL CO., INC.

Also makers of

REZ-N-DYE • REZ-N-GLUE • REZ-N-LAC

326-328 WEST 70th ST., NEW YORK 23, N. Y.

Uniform Granulation of Plastics Scrap is Profitable with an

AMERICAN "KC"

ROTARY KNIFE CHOPPER

GRINDER

- Reduces sprues, gates, and rejects to homogenous granules for uniform mold flow.
- For storage — greater compactness and ease of handling.
- 200 to 400 lbs. per hour consistent output.
- No oversize passed — fines held to an inconsequential minimum.
- Sturdy plate construction does not yield or crack under unusual strain.

Hinged, smooth contour crushing chamber permits easy cleaning for changes without contamination — no pockets to accumulate residue. Tool steel cutting blades give finest, rapid shearing action.

For greater plant efficiency it is profitable to locate centrally a large capacity "KC" Grinder accessible to all presses, or localize installation of smaller capacity "KC" Grinder to handle each one or two presses.

Write for bulletin on "Grinding Plastics Profitably"

American PULVERIZER CO.

Originators and Manufacturers of Ring Crushers and Pulverizers

1117 Macklind Ave.
St. Louis 10, Mo.

Table II.—Flexural Fatigue Strengths of Grade L and Grade C Laminates

Direction of test on sheet	*Maximum fiber stress to cause failure*			
	Grade L		*Grade C*	
	1 cycle	*10,000,000 cycles*	*1 cycle*	*10,000,000 cycles*
	p.s.i.	*p.s.i.*	*p.s.i.*	*p.s.i.*
Machine	23,300	4,860	20,300	4,050
Cross	18,700	4,060	18,000	3,710

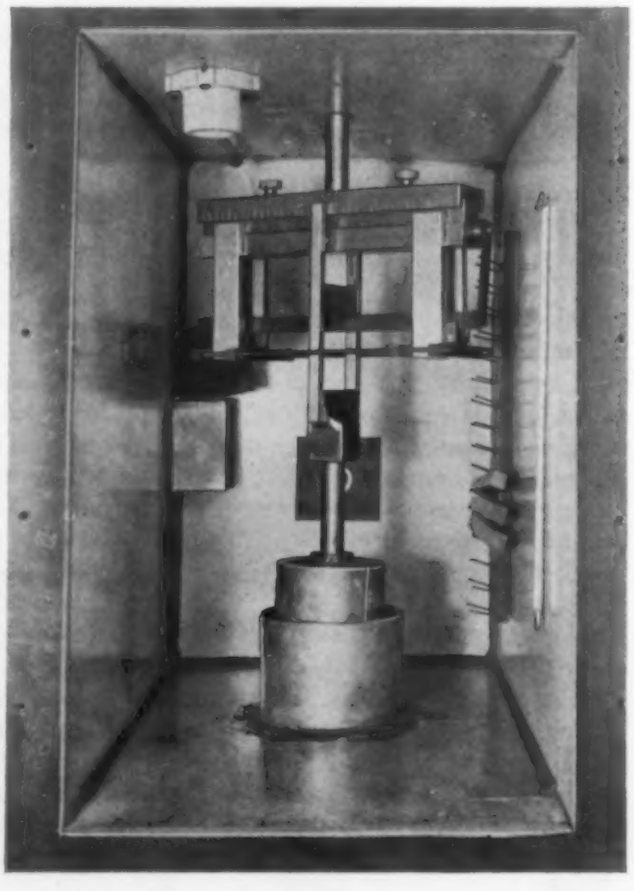
Table II. To compare the flexural fatigue strength of these materials with the flexural strength of the same materials, values of maximum fiber stress to fail at one cycle are also given. The σ-N diagrams for the fatigue tests are shown in Figs. 6 and 7.

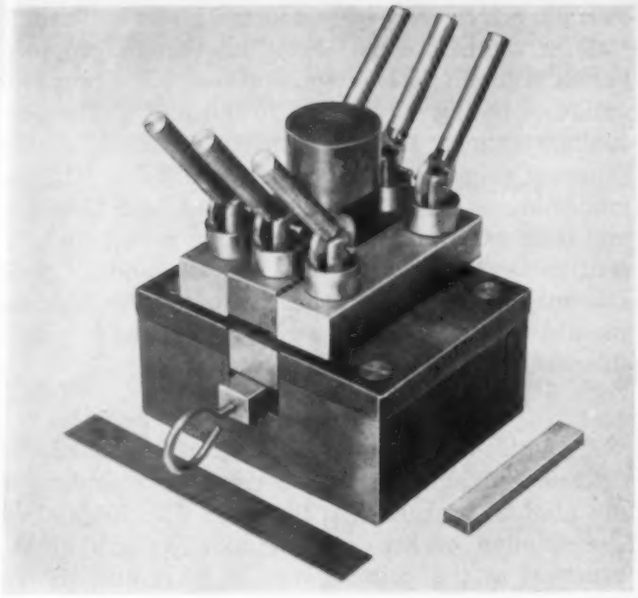
Impact strength, effect of temperature

The specimens were prepared and tested in accordance with Federal Specifications L-P-406 for the Izod test, corrections being made for friction and windage. The size of the specimen was 2½ by ½ by ½ inches.

For tests at —70 and 160° F. the machine is enclosed in a cabinet insulated with 2 in. of Foamglas between Presdwood walls. The cabinet is fitted with

4 — Jig used for determination of flexural properties





5 — Modified double-shear jig has quick-acting eccentric cams and levers

a Thermopane window to enable the operator to observe the test and a pair of electrically heated aviators' gloves for cold tests or insulated leather gloves for hot tests. Suitable levers are also provided to reset the pendulum and indicator. The temperature of the cabinet is normally read from a toluene thermometer suspended in the cabinet and checked by means of copper-constantan thermocouples. One couple is located on the jaws of the impact machine, a second is placed near the thermometer and a third is sealed in the center of a specimen in the specimen rack in order to observe thermal equilibria in the system. For the cold tests it was found necessary to remove the lubricants supplied with the impact machine and to substitute kerosene in their place. The values of impact

Table III.—Effect of Temperature on Properties of Grade L and Grade C laminates

Test	*Property*	*Change at: 160° F.*	*—70° F.*
		%	%
Compression	Ultimate strength (Edgewise)	—22	
	Modulus of elasticity	—25	
Tension	Ultimate strength	—18	
	Elongation	— 6	
	Modulus of elasticity	—22	
Flexure	Maximum fiber stress	—24	+19
	Modulus of elasticity	—27	+33
Bearing	Stress at 4% deformation	—10	
	Ultimate strength	—20	
Shear	Ultimate strength	—16	
Impact	Energy to break	+24	—38

IN HANDY POWDER FORM

Gypsy

PLASTISOL DYES

15 standard colors
Perfect shelf life
No deterioration

Hot or cold dip
Better fastness
More even results

Now, with powder GYPSY PLASTISOL DYES and with newly perfected NYSOL you can compound your own dye solution for every popular plastic! NYSOL dissolves the dye, aids penetration, assures even dyeing. Mixed with solvents or water, per formulas furnished, dye is ready for instant use. Write for prices and full details.
Or—we are equipped to handle your dyeing problems in our own plant—roll or sheet film, molded pieces, extruded or cast shapes. Contact us.

New! Gypsy Cement! Non-inflammable, non-explosive. Clear or colored weld, solvent-type cement. For Plexiglass, Lucite, Polystyrene.

FREE TRIAL!

We'll prove Gypsy Plastic Dyeing is beautiful, practical. Send sample of plastic material and color desired. We'll dye it and include sample of Gypsy Plastic Cement to match. No obligation.

GYPSY DYES, INC.

Division of Wittie Mfg. & Sales Co., 1414 S. Wabash Ave., Chicago 5

at your service . . .

ON ANY PLASTIC MOLD PROBLEM!

This trademark means "Larry Cook" and "Larry Cook" means outstanding plastic mold craftsmanship on every job "from hobs to harmonicas"!

Behind this trademark stands New England's most complete, small plastic mold shop . . . a shop of mold makers that thrives in making the hard ones look easy!

Get to know Cook service . . . get to know Cook results . . . prove for yourself what many manufacturers already know . . . that the place for any plastic mold problem is No. 65 Massasoit Avenue.

Why not call Larry for a consultation NOW?

QUALITY COOK MOLDS

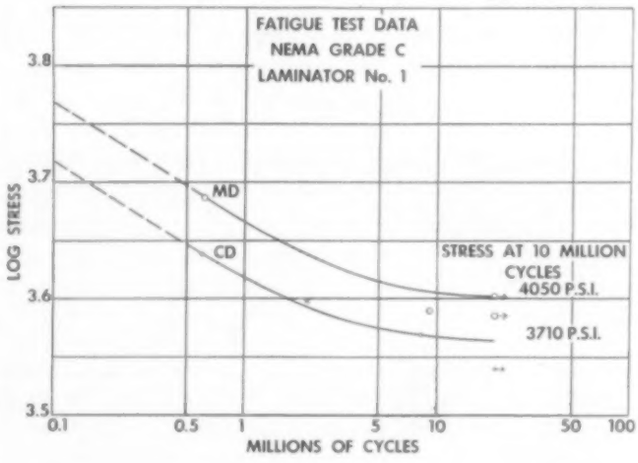
LAWRENCE H. COOK, INC.
65 MASSASOIT AVENUE
EAST PROVIDENCE 14, R. I. • TEL. EA. 3881

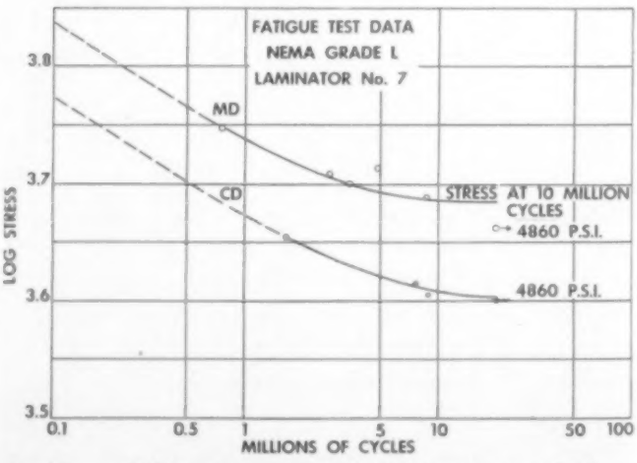
strength which were observed are given in Table I.

Since there is considerable interest in property values at high and low temperatures, some property values were determined at —70 and 160° F. The percentage change in the property referred to the property value at 77° F. is given in Table III. The values are averages for all makes of both Grade L and Grade C laminates. It should be noted that the test values for compressive, tensile, and flexural strengths decrease at higher temperatures whereas the test values for impact strength increase at higher temperatures as one might expect.

Deviations found in testing

A mathematical analysis of the results of the flexure tests at 77° F. has been made according to the method suggested in the "A.S.T.M. Manual on Presentation of Data". In Table IV each of the averages in the column headed "Average" is the average of test results on four adjacent specimens cut from the same sheet. The Standard Deviation is the square root of the average of the squares of the deviations of the individual results from their average. Knowing these two values, plus and minus limits were then calculated using a "Statistical Probability" of Ps = 0.99; that is to say, if the following conditions are met there are 99 chances in 100





6 and 7 — σ-N diagrams showing results of fatigue tests on Grade C and Grade L specimens measuring 2½ by ½ by ½ inches

Table IV.—Statistical Analysis of Flexural Test Results on Grade L Laminates[a] (⅛ in. thick sheets; specimens cut in machine direction and tested flatwise)

Manufacturer No.	*Average*	*Standard deviation*	*Limits for Ps = 0.99*	
		p.s.i	*±p.s.i.*	*±%*
		Maximum fiber stress		
1	26,000	548	1,848	7.10
2	23,700	606	2,043	8.62
3	20,600	2,302	7,762	37.65
4	25,600	577	1,945	7.60
5	21,000	1,661	5,600	26.65
6	27,700	497	1,675	6.04
7	23,300	409	1,379	5.93
8	21,300	482	1,625	7.64
9	25,300	579	1,952	7.71
10	23,800	158	532	2.23
Maximum	27,700	2,302	7,762	37.65
Average[b]	23,808	782	2,636	11.67
Minimum	20,600	158	532	2.23
		Modulus of elasticity		
1	1,480,000	45,000	151,700	10.3
2	1,000,000	29,100	98,130	9.0
3	1,140,000	60,400	203,700	17.0
4	1,220,000	51,100	172,300	14.1
5	972,000	33,900	114,300	11.76
6	1,360,000	67,200	226,600	16.70
7	1,020,000	76,700	258,600	25.35
8	995,000	41,100	138,600	13.93
9	1,240,000	50,700	170,900	13.78
10	1,260,000	17,100	57,660	4.57
Maximum	1,480,000	76,700	258,600	25.35
Average[b]	1,170,590	47,230	159,249	13.65
Minimum	972,000	17,100	57,660	4.57

[a] Since these calculations are a study of deviations found in testing, test values were included which were discarded as erratic in compiling the information given in Table I.

[b] Average for all specimens tested.

that the true value for the material lies within the limits shown in the column labeled "Limits." Conditions: 1) The material sampled as homogeneous; 2) The distribution of values for the material is normal; 3) The sample is a random sample. In the last column of Table IV are given the limits for each material in terms of percentage of the test values found in the column headed "Average," so that comparisons may be made between the various tests.

Acknowledgment

Grateful acknowledgment is extended to Mr. G. H. Clark of The Formica Insulation Co. and Mr. G. H. Mains of The National Vulcanized Fibre Co. for their guidance throughout the project. The author also wishes to thank the member laminators of the National Electrical Manufacturers Association for their cooperation and generosity in making this work possible.

When you talk about extrusions held to a tolerance of ±.001", you are talking a modern miracle. Yet, Anchor Plastics extrudes small bore (.020") "Aeroflex"* polyethylene tubing for intra-venous injections which has an O.D. confined to *well within* these close limits. The astoundingly close tolerance with which this tubing was extruded amazed the medical profession.

While all Anchor extrusions do not *have* to be produced with such painstaking accuracy, all of them are held to limits consistent with the use to which they are to be put. Anchor Plastics are produced by craftsmen skilled in the technique of extrusion.

Therefore, when you have an assignment that requires *accurate* extruding of any thermoplastic, let Anchor quote on your requirements.

*Reg. U. S. Pat. Off.

ANCHOR PLASTICS CO., INC.
533-541 Canal St., N.Y. 13, N.Y.
Plastic Extrusions Exclusively

ANCHOR PLASTICS COMPANY

THE PLASTISCOPE*

INTERPRETATIONS OF THE CURRENT NEWS

By R. L. VAN BOSKIRK

New thermoplastic

AFTER months of experimentation and development, and in the midst of considerable speculation by the trade, United States Rubber Co. has at last released partial information on one of the new resins with which the company expects to make a big splash in the plastics industry. The material has been christened Versalite after passing through its developmental stages under the designation of Es-es.

The resin is classified by the company as one of the acrylonitrile group; it is assumed this means that acrylonitrile is one of the copolymers used. At present, the material is furnished only in sheet or fabricated form in almost any thickness above 0.020 inch. A processor now using it calls the material a laminate but the producer prefers to classify it as "sheet." It can be formed into irregular and compound shapes as large as 5 by 10 ft. with solid color throughout and dull, satin or embossed finish. It has not yet been perfected as an injection molding material but may be in the future. Officials say that Versalite sheeting will not chip or warp and is highly resistant to gasoline, oils, and most commercial cleaners. The softening point is from 160 to 220° F., varying according to the particular compound used. Tensile strength is from 3500 to 4500 p.s.i., and the dielectric constant is given by the company as 125. It is non-corrosive and stable under changing atmospheric conditions, with good electrical insulating properties and a low rate of heat conductivity.

Because of low water absorption and good thermal insulating properties, the material is being used for a new type of shipping container for dry and frozen foods, as well as in home freezers, commercial freezing units, and similar products. It has also been formed into two complete halves or sections of a suitcase. Future planned applications include radio cases and component parts for boats, automobiles, buses, airplanes, and trains. It can be cut, drilled, and punched on ordinary wood or metal working equipment, and because of its ease of forming and finishing, it opens new fields for elaborate designs without expensive tooling. Methods of bonding the material to itself or other materials in production have also been developed.

*Reg. U. S. Patent Office.

Beaded cord chain

PLASTIC beaded cord chain has been developed by Gries Reproducer Corp., 133rd St. and Willow Ave., New York 54, N. Y. The beads are injection molded of cellulose acetate, although other molding materials may be used. They are available in two sizes and may be had in single strands of red, yellow, pink, blue, green, black, white, or combinations of any two of these colors.

Delivery on laminates

HIGH pressure laminators at last report were quoting five to six weeks' delivery on orders of all types. To show the difference in the amount of business being done, the promised delivery time a year ago was 10 weeks. During war-time, from 12 to 13 weeks was a normal quotation. Much activity is coming from small electrical manufacturers, whose business seems to have picked up considerably since last Fall.

Informative labeling

SEVERAL months ago, after the decision in the Buchsbaum case, the Federal Trade Commission dismissed cases against five other firms who manufactured plastic materials of "glass-like appearance" and who used trade names with the word "glass" in them. The Government had charged that use of the word "glass" was misleading. When the cases were dismissed the Commissioners reserved the right to re-open the proceedings if necessary to the public interest.

We have been informed that the Government has by no means relaxed its vigilance in watching what they call the labeling of synthetics as the real thing. The use of the words, leather, wood, glass, wool, etc., must still be carefully handled when used as a modifier or adjective describing a given product not made of that particular material.

The Federal Trade Commission is watching advertisements and sales appeals which might lead the customer to believe that a synthetic is a natural product. There has been a report that when a synthetic is actually superior to a natural material, or when a piece of synthetic fabric looks or feels like wool or cotton, the seller must give warning that the product isn't really leather, wood, cotton, or whatever it may resemble.

This problem is all a part of the complete picture of informative labeling, and merchandisers are suggesting that labels should describe a product in its own right as a synthetic and make no attempt to compare it with other materials.

Vinyl resin coating

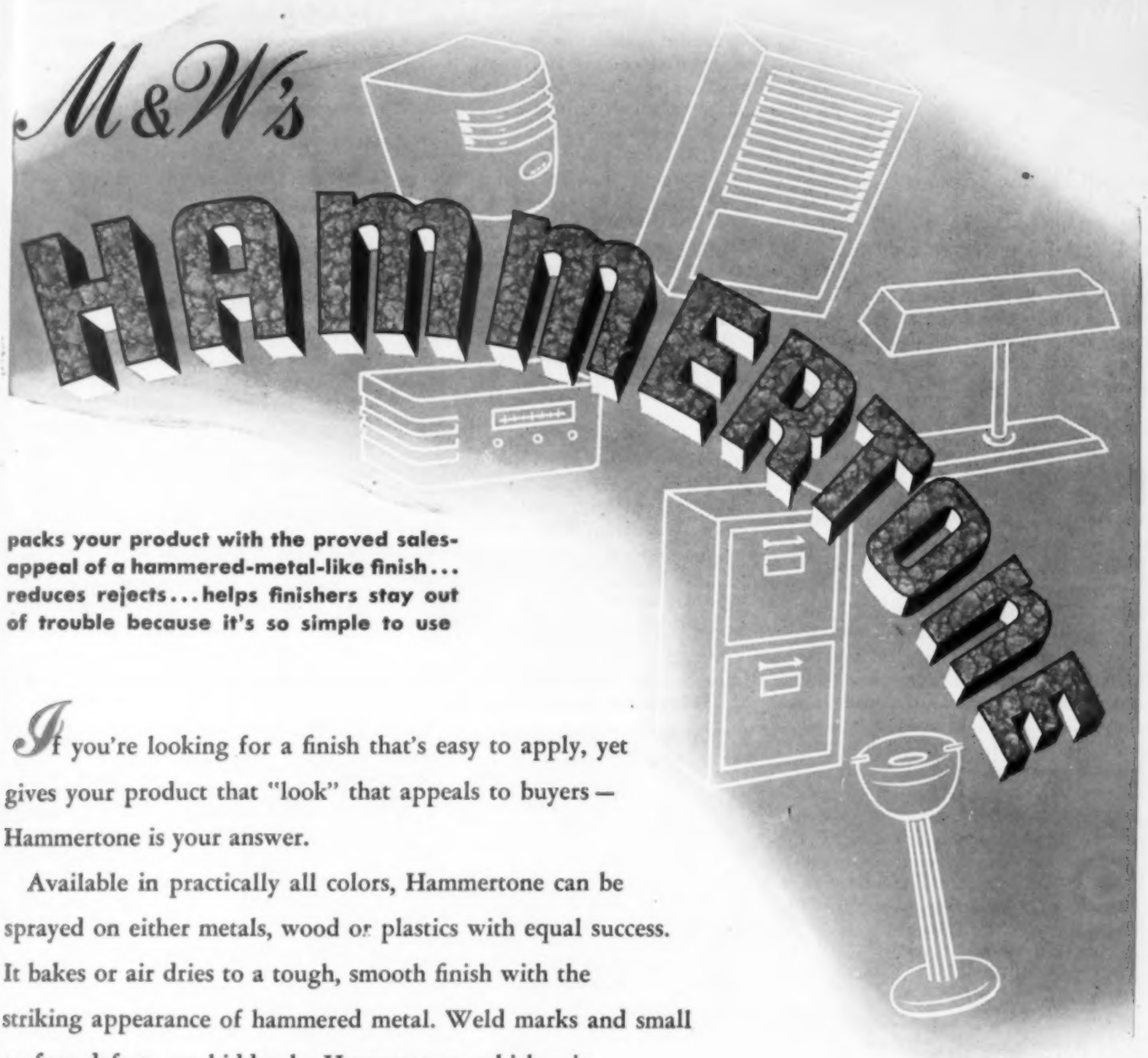
BASED on a polyvinyl chloride resin, a new coating material called Ultrasol, said to combine flame-resisting qualities with exceptional abrasion and weathering characteristics, has been announced by the Monsanto Chemical Co.

Fabrics coated with Ultrasol are said to be similar in appearance to the more common nitrocellulose-treated products. Applied by knife or roller coating to paper or fabric, the material gives either a smooth, colorful finish or a decorative leather-like effect, and is equally effective in bright colors or pastels, according to the developers.

The Ultrasol-type coating is said to be economically competitive with the least expensive coating materials and offers advantages as a surface coating for use in restaurants and cocktail lounges, or on upholstered walls and other modern decorative schemes. Monsanto tests show the material to be resistant to alcohol, acids, alkalies, vegetable and body oils, and to cracking or crazing in even sub-zero temperatures. The developers believe that Ultrasol's applications are not limited to industrial uses but will add to beauty,

Sure Cure for Finishing Room Headaches...

M&W's HAMMERTONE



packs your product with the proved sales-appeal of a hammered-metal-like finish... reduces rejects... helps finishers stay out of trouble because it's so simple to use

If you're looking for a finish that's easy to apply, yet gives your product that "look" that appeals to buyers — Hammertone is your answer.

Available in practically all colors, Hammertone can be sprayed on either metals, wood or plastics with equal success. It bakes or air dries to a tough, smooth finish with the striking appearance of hammered metal. Weld marks and small surface defects are hidden by Hammertone, which — in addition to its uniform results in application — reduces rejects to a minimum.

For further information, write for Technical Data Bulletin #115 or ask your M&W representative. Color card is available.

PIONEERS IN PROTECTION

M.&W.Co. 1876

. . . where industry goes with finishing problems

MAAS & WALDSTEIN COMPANY NEWARK 4, NEW JERSEY

Boston 15, Mass. • Chicago 12, Ill. • Los Angeles 34, Calif.
Pacific Coast Division: SMITH-DAVIS CO., 10751 Venice Boulevard, Los Angeles 34
PRODUCERS OF LACQUERS, ENAMELS, SYNTHETICS AND SPECIALIZED PRODUCTION FINISHES

THE PLASTISCOPE

protection, and economy in the home.

A significant factor in the future of Ultrasol is the sharp reduction in the number of coatings needed. It is reported that only about one quarter the number of coats needed with other materials are required to produce a satisfactory surface with Ultrasol.

Benzol

POTENTIAL demand for benzol in 1948 has been estimated at 192,000,000 gallons. The plastics industry is highly interested because, without benzol, there would be little styrene or phenol. The production for 1947 was around 165,000,000 gal.; the average month was 14,000,000; but December alone was 16,000,000.

Producers are pointing out that the 16,000,000 figure in December should not be taken as a steady month-by-month production figure because there are too many outside factors involved. A much greater production in 1948 than in 1947 is not anticipated and, consequently, a shortage is threatened, especially since the coal strike will undoubtedly have a serious effect on the amount of coal that can be coked during the year. It is possible that 5,000,000 gal. of benzol may be imported, mostly from Canada.

Polyvinyl alcohol film

PRODUCTION of Reynolon 4000 series, a polyvinyl alcohol film in 0.002, 0.003, and 0.004 in. gages has been announced by the Plastic Div., Reynolds Metals Co., 19 E. 47th St., New York, N. Y. This is the fourth in a series of functional plastic films to be announced for industrial use by Reynolds Metals.

Reynolon 4000 series covers a clear transparent film which, the developers advise, is water soluble but highly resistant to fats, oils, and greases, and is unaffected by most organic solvents. It is odorless, tasteless, and non-toxic.

The film is usable in the low pressure laminating industry as a mold release to give shine or "plastics" finish. In automobile tires it is used to interleave recap stock or camelback. It also has possibilities in the optical industry, presumably as a transparent laminating sheet. If treated properly, it may be usable in vacuum packs. In the laundry and kindred commercial fields, it is used as a container for such things as blueing which can be dumped into a vat, container and all, since the film will dissolve in water. The company believes that it may become highly valuable as a packaging film when there is no need for a moisture barrier or where the film may serve as a lining between the item and an over-wrap which serves as the moisture barrier. A chewing gum inner-wrap where the inner lining is used to preserve flavor would be an example.

Price reduction — The Reynolds Plastic Div. has also announced a reduction of 6¢ per lb. for the Reynolon 2000 series in clear and pastel colors. Reynolon 2000 series is a vinyl organosol furnished in 0.002 to 0.004 in. gage. It is used for lamp shades, shower curtains, clothes storage bags, table cloths, sheeting, etc.

Television panel boards

AMONG the interesting uses of plastics in television is in the panel board within the set to which various pieces of electrical equipment are attached. The development of this laminated panel board has come directly from the tiny panel board used in hearing aids. It is made of a paper base with phenol or cresylic resins. The material takes a little longer to process than standard high-pressure laminates but up to date the finished material costs no more than standard XXX high-test insulation material.

Most electronic instrument failures are due to breakdown of insulation, but the producers of this new panel material believe that they have found here an item that is far superior to anything heretofore in use. For example, its insulation resistance values are several hundred percent higher than like material manufactured a few years ago.

S. P. E. membership

THE Executive Committee of the Society of Plastics Engineers has established a Professional Grade Membership predicated on 10 years of qualifying experience in the plastics industry. An applicant having a Ph.D. in science or engineering will be allowed seven years credit and will, therefore, need only three additional years of qualifying experience to be eligible for a Professional Grade Membership. Similarly, candidates with an M.S. or B.S. degree will be credited with six and four years, respectively, and a bachelor's degree from a non-technical college rates a two-year experience credit.

It was also announced by the Executive Committee that the next annual conference of S.P.E. will be held in Philadelphia in January, 1949.

Bonded glass fabric

AN UNWOVEN bonded glass fabric of continuous glass filaments is announced by The Glass Fiber Corp., 36-40 Vernon Blvd., Long Island City, N. Y., as being suitable for plastic impregnation and lamination. The fiber arrangement provides high strength in one direction and flexibility in the other, according to the developers. Bonded glass fabric is a good reinforcing medium in high and low pressure molding and is claimed to be an improvement over bonded mats because of a low binder content (starch or resin according to the requirements of the user) and the regularity and uniformity of its texture.

Bonded glass fabric is made in continuous 30-yd. lengths, trimmed to 36 in. wide (untrimmed, 38 in.); standard thickness is 15 mils. Individual lengths will be spliced with 2-in. wide pressure sensitive tape and rolled to any length, according to specifications of the customer.

Plastics in new aircraft

THE Air Force is installing special 10-ft glass fiber wing panel sections on a Douglas C-54 Skymaster which is to be used as a radar and electronic flight research airplane. The non-magnetic and good electrical qualities of the plastic material are utilized to prevent interference with electronic equipment mounted within the panel, according to *Aviation Week*. Purpose of the program is to develop high-strength plastic wing materials to contain future radar and communication equipment on high speed aircraft, on which antennae are impractical.

The Air Force is also conducting tests on a sandwich material monocoque tail boom assembly for the Northrop P-61 Black Widow night fighter, says the same publication. The boom is fabricated of glass laminated plastic, similar to that used

DO YOU WANT . . . . . .

Better Molding Pellets?

Our first quality Thermoplastic compounds are economical. Formulated for volume production; mold at faster cycles with fewer rejects;—all materials supplied in the form of dust-free pellets.

Prompt deliveries of popular bright colors of Cellulose Acetate, Ethyl Cellulose, Polystyrene and other thermoplastic injection molding powders.

Large scale producers—

EVERY TYPE THERMOPLASTIC INJECTION POWDERS

CELLULOSE ACETATE—POLYSTYRENE—
ETHYL CELLULOSE—BUTYRATE—
VINYL & ACRYLIC

Write us for details; or
Telephone CRanford 6-2900
Cable Address: "Gering" Kenilworth, N. J.

GP PLASTIC MATERIALS

GERING PRODUCTS, Inc.

NORTH SEVENTH ST. KENILWORTH, N. J.

For Future Reference

M. N. Martindell

When you find a Plastic Molding Organization which combines the experience of an individual's lifetime with the equipment and skill you expect to find in the most modern plant, then you have discovered a most valuable ally for the efficient and economical development of your product.

Such an organization does exist. Note the name NOW for future reference.

MARTINDELL MOLDING CO.

OLDEN and 4th Street • TRENTON, NEW JERSEY

THE PLASTISCOPE

on the fuselage of a Vultee BT-15 during the war.

Another recent aviation development is a new astro-window to permit navigators on long-range stratosphere airliners to "shoot" the stars even in daytime. The streamlined window is composed of an outer plate, which is a large optical lens that has been ground and polished to reduce refraction errors, and an inner plate, which is acrylic and houses a defrosting system. It was designed for Air Force and commercial planes by Bausch & Lomb Optical Co.

Lignin in Northwest

A LIGNIN recovery plant that will have an initial capacity of about 16 tons per day is planned by the Puget Sound Pulp and Timber Co. at Bellingham, Wash. The lignin produced will be free of sugar content, making it highly desirable as a concrete additive, said to make a type of concrete requiring considerably less water in the mix and capable of quicker setting.

The company is already recovering ethyl alcohol from waste sulfite liquors, once a major disposal problem. Production at this operation is at the rate of 2,000,000 gal. a year.

Belgium plastics fair

A COMMERCIAL and industrial fair of plastics is being held in Brussels, Belgium, from May 29 to June 13 under the name 1st International Fair of Plastics. The fair constitutes an opportunity for foreign markets to make contacts with the Belgian market and is open to anyone connected with the plastics industry.

Future for alkyds

AUTOMOBILE bodies, small boats, stockings, and many other products, may soon be made entirely from the alkyd resin plastics, predicted Dr. Charles L. Levesque of the Resinous Products and Chemical Co., Philadelphia, Pa., at a recent meeting of the Passaic Valley Group of the American Chemical Society's North Jersey Section.

Dr. Levesque pointed out that the alkyd resins can be modified with oils to yield materials of almost any desired texture and hardness. Among the alkyd resin products currently available are varnishes, caulking compounds, plastics, synthetic rubbers which defy oil, and softening agents for blending with other types of rubbers and plastics, he reported.

Alkyd resins are made by combining certain alcohols and organic acids, the molecules being linked together to form chains and networks, explained Dr. Levesque. The pure resins are hard, brittle, and insoluble in all but the most powerful solvents, he said, but their fundamental properties can be altered greatly if oils containing fatty acids are incorporated.

Flower pots

POLYSTYRENE flower pots caught on in the flower trade to a degree not anticipated by the producers. Plant growers claim that the polystyrene pots retain moisture longer under the hot, dry conditions found in the average home; it is possible that plants may even grow better in plastic containers than in clay pots under domestic surroundings because most housewives tend to under-water their plants.

Commercial flower growers like the plastic pots because they have found that soil acids do not make any impression on the surface gloss inside the pots. White roots grow against the inside wall of the pot which would not be the case if the plant was absorbing a chemical toxic to protoplasm. Commercial growers like the new pots because of the reduced weight in shipping, elimination of breakage, and attractive colors which enable retailers to save time and money by foregoing pot decorations. The various colors are also helpful to greenhouse men; they can place different varieties of plants in different colored pots so that one type may be distinguished from another at a glance.

Rogers Plastics Corp., North Wilbraham, Mass., which is among the manufacturers of these pots, reports as an interesting sidelight that they have been selling the large pots, called jardinieres in the trade, to hotels for use as ice buckets.

New fabric for laminating

A FABRIC that has properties which may be of value to laminators has been introduced by United States Rubber Co. The company is eager to get this fabric into the hands of laminators so that experiments can be pressed to determine the ultimate possibilities.

The new material is called "Strex." It is an elastic woven cotton fabric with no rubber or synthetic material content. The elasticity is obtained by coiling the individual cotton strands before weaving, the coils resembling tiny wire tension springs. The stretch of the woven fabric can be regulated to from 20 to 100 percent. Most woven goods stretch only 5 to 10 percent. Knit goods may stretch from 30 to 75 percent.

An outstanding feature of "Strex" is that it has an independent stretch; that is, it can be stretched in one direction while remaining stable in the other. It has moderate tension—not as much as rubber, but much more than ordinary knit goods.

It is thought that this material may be particularly applicable for postforming and deepdrawn work because it will give in one direction without contracting in the other. Theoretically, at least, "Strex" will not wrinkle or give way at the corners. It will cost more than ordinary cotton woven fabric of the same weight because of the extra cost of coiling the yarn strands.

Experimental quantities are currently available.

Washington S. P. E.

A NEW chapter of the Society of Plastics Engineers has been organized in Washington, D. C., with 52 charter members. Membership of this Washington-Baltimore Section includes a representative from practically every government group or company associated with plastics in that area, and it is thought to be unique for the number and variety of technicians it includes. There is now some sort of plastics specialist in almost every branch of the government, and there is scarcely any phase of plastics with which one of these technicians is not conversant.

Plastics school

A NEW school for those interested in obtaining further knowledge about plastics has now been in operation in Washington, D. C. for about a year. The organizer is Russell Bailey who is a plastics engineer with the Navy Dept. and who will be remembered by many in the industry for his research work during the war.

The school has various courses

When "the heat's on"... pressure, too, this PERBUNAN gasket can take it!

When deciding on a material for the gasket of their famous pressure cooker, the Ekco Products Company chose a *Perbunan* composition because it:

1. *Does not swell, soften or lose its shape under pressure at 250° F. even when exposed to most vegetable and animal fats and oils.*
2. *Does not harden or become brittle in use or when exposed to air.*
3. *Has no taste or odor, even when boiled in water for long periods of time; not harmed by washing in hot, soapy water.*
4. *Has good physical properties such as: (a) high tear resistance, (b) good tensile strength, (c) good elongation.*
5. *Materially reduced the manufacturing cost of the* EKCO *Pressure Cooker.*

The Biggest Name in Housewares

EKCO

Other manufacturers are finding new uses for versatile *Perbunan* every day. They like its toughness and the way it stands up under severe heat, cold and a wide variety of oils, acids, and greases . . . and they like its ready adaptability to the many complex molded shapes of resilient engineering materials.

NEW FEATURE: *Perbunan's* new stabilizer permits the use of a wide variety of delicate shades that retain their original color.

Maybe there's a place in your business where the use of versatile *Perbunan* in a plastics or rubber part may save you plenty . . . both in initial cost and replacements. We will be glad to give you all the information you need.

ENJAY COMPANY, INC., 15 West 51st Street, New York 19, N.Y.

PERBUNAN

REG. U. S. PAT. OFF.

THE RUBBER THAT RESISTS AIR, SUN, WATER, HEAT, COLD AND TIME

THE PLASTISCOPE

which are offered a number of hours in the evening, but a particular feature is an 8-hr. course on Saturdays during which students may gain practical knowledge working in both the chemical and engineering branches of plastics.

Synthetic fiber research

A BROCHURE entitled "The Synthetic Fibers Industry," has been issued by George S. Armstrong and Co., Inc., Industrial Engineers and Management Consultants, 52 Wall St., New York, N. Y. This is the company's eighth paper on the economic and financial aspects of various American industries. Number VII was on "Plastics and the Plastics Industry." The new brochure is a comprehensive coverage on statistics, growth, and trends of synthetic fibers. The estimated output of major synthetic fibers for 1946 in the United States was listed as:

Estimated Output of Major Synthetic Fibers,* 1946

Major synthetic fibers	*Pounds*
Viscose and cuprammonium	623,900,000
Acetate	230,000,000
Total rayon	853,900,000
Nylon yarn	20,000,000
Fiberglas yarn	12,000,000
Aralac	10,000,000
Saran	8,000,000
Vinyon	1,500,000
Total other	51,500,000
GRAND TOTAL	905,400,000

*Rayon Organon published by the Textile Economics Bureau, Inc., New York, N. Y., for rayon production; other production is estimated.

In conclusion, the authors estimate that the consumption of cotton, rayon, silk, and nylon in the United States for 1950 in millions of lb. will be respectively 4,988; 900; 7; and 90, in comparison with the figure shown for 1946 in the table above.

Pacific Coast packaging

PLANS for the First Western Packaging Exposition and Conference on Packaging, Packing, and Shipping were advanced at a meeting of Pacific Coast packaging leaders held recently in San Francisco, Calif. The exposition will be held in the San Francisco Civic Auditorium August 10 to 13. Concurrently with the first three days of the exposition, there will be held the First Western Conference on Packaging, Packing, and Shipping.

FUTURE FILE

It has been reported that a mixture of wax with 7 to 10% polyethylene added is now being used for coating paper for bread wraps. It is said that the coating permits faster speeds of wrapping and a thinner application of wax; does not crack; and the wrapper can be re-used by the housewife for covering food to be placed in the refrigerator.

Among the interesting and growing uses for high styrene copolymers is the volume used for coated paper, the copolymer being used to either entirely or partially replace casein. Our understanding is that this formulation is in latex form and is sometimes altered to include 50% copolymer and 50% casein for use as clay binder; at other times it will replace casein 100%, according to developers.

Still another use for styrene monomer is its co-polymerization with oils to help speed up the drying rate of oil paint. It reportedly gives excellent durability at substantially reduced cost because a smaller amount of linseed, soya, or dehydrated castor oil is necessary. The resulting paint is largely for interior use, but experiments are also underway regarding its use out of doors where it is particularly adaptable for enamels for sign trims, etc. The developers believe that the styrene will also improve the quality of outdoor house paint.

RAW MATERIALS

Plaspreg, a resin based on Furane polymers and manufactured by Furane Plastics and Chemicals Co., 4500 Brazil St., Los Angeles, Calif., has been on the market for three years, but increasing interest in its possibilities has created considerable curiosity about the resin.

According to the manufacturer, it transforms weak and easily broken gypsum plaster castings into solid, substantial products. When treated with Plaspreg resin, ordinary casting plaster becomes from 300 to 400% harder than before; offers high chip and scratch resistance; has improved temperature and chemical resistance; and can be coated with lacquer or baked enamel finishes of unrestricted color range.

Manufacturers of decorative statuary, lamp bases, and plaster forms of every description, including industrial items such as patterns and tools, have found the use of Plaspreg satisfactory and economical. For example, a lamp base manufacturer producing a 25-lb. product that cost $15 when made from another material is reported to have used 30¢ worth of plaster and $1.50 worth of Plaspreg to produce a similar base.

The manufacturer suggests that the liquid resin be applied to large plaster castings, after they have thoroughly dried, by brushing or immersion. For the production of small parts, a 2 to 3 min. immersion in the resin is suggested. An electrically heated, thermostatically controlled oven is suggested for curing Plaspreg. A temperature range of 155 to 165° F. is recommended for optimum results.

Valite 7796-D is a new synthetic extender for shellac manufactured by the Valite Corp., 400 W. Madison St., Chicago 6, Ill. The company believes it is an especially timely development since the shellac supply from India has been drastically reduced, and that country's Government has recently warned its industry, which each year produces 40,000 to 50,000 tons of lac, that it faces serious competition from other materials.

Valite has been used primarily as an extender for shellac in phonograph records. The company is currently engaged in further product development of Valite resins.

Polyethylene Glycol Mono Oleates (S1005) and (S1010) and Polyethylene Glycol Mono Laurate (S1019) are chemical esters now being commerically produced by Glyco Products Co., Inc., Brooklyn, N. Y. These esters are of an oily character and dissolve clearly in water. According to Glyco, the products chemically are polyoxyethylene oleates and laurates having a molecular weight above 800. They are nonionic, non-toxic, light in color, and fluid or grease-like in consistency. They dissolve clearly in water, alcohol, esters, hydrocarbons, and vegetable oils. At 20° C., they are slightly heavier than water. They all have high boiling points and exhibit surface-active properties.

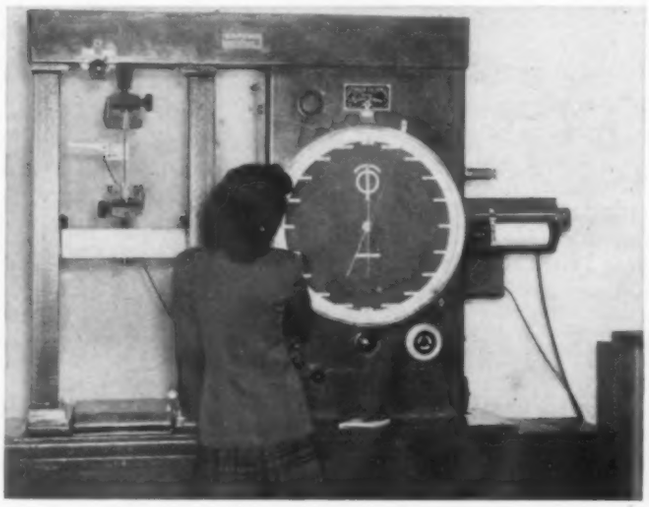
These new materials are expected to be useful as special detergents

If you want to be sure your plastic part is right for the job

You can't do better than call on Watertown with its 33 years of plastic molding experience.

Watertown service is a Complete Custom Service from formulating molding materials to the final buffing, polishing and assembly. In addition, Watertown's modern laboratory service keeps a careful check, step by step, on the progress of each job, thus insuring the customer an absolute minimum of costly rejects.

Send us a drawing or a blueprint, or call in the Watertown representative in your vicinity. Sales offices are located in Cleveland, Chicago, Detroit, Milwaukee and New York.



• A "Plus" Watertown Service....

Periodic testing of all molded parts from basic material to finished product is routine in Watertown's completely equipped laboratory. Accurate readings in flexural, tensile and compressive strengths, as well as stress and strain curves are obtained from the machine illustrated specifically designed for the fatigue testing of plastics. Fissures, porosity and stray metal inclusions are detected by a new electronic X-ray unit.

THE WATERTOWN MANUFACTURING COMPANY
1000 ECHO LAKE ROAD, WATERTOWN, CONNECTICUT

Watertown
A NAME AS OLD AS THE PLASTICS INDUSTRY

Valite 7796-D
EXCLUSIVE TRADE MARK

THERMOPLASTIC RESIN

Investigate This New...

LOW-COST EXTENDER For SHELLAC

- standard, controlled quality
- constantly available in unlimited quantity
- for immediate delivery
- from a domestic source

WRITE TODAY FOR FREE FOLDER

DEPT. 25

VALITE CORPORATION

400 W. MADISON, CHICAGO 6 • WHITNEY BUILDING, NEW ORLEANS 12

Sales Agents:

WM. E. MUNN
96 Liberty Street
New York City 6, N. Y.

BARADA & PAGE, Inc.
Kansas City—St. Louis—Oklahoma City—Tulsa
Wichita—Dallas—Houston—New Orleans

S. L. ABBOT COMPANY
800 South Santa Fe Avenue
Los Angeles, California

135 King Street
San Francisco, California

THE PLASTISCOPE

in textile and fiber processing; as penetrating lubricants; grinding media for pigments; and plasticizers for water dispersed products and water-insoluble resins, elastomers, plastics, coatings, etc.

Fosterite—A special process developed by H. F. Minter and M. M. Leven of the Westinghouse Research Laboratories now permits large sections of a photoelastic resin of the Fosterite family to be cast for three-dimensional studies of "frozen stresses."

Photoelastic resins in actual use are made up into models such as, for example, a crane hook. After being heated, the model is loaded and then cooled gradually to room temperature. When viewed through polarized light, the plastic replica shows vividly the location, direction, and magnitude of stresses.

The new resin is still in the experimental stage and is not yet available commercially.

Plastiset—New resin-catalyst-promoter systems have been developed which will cure, at low temperatures, polyester type resins that normally require heat for curing. Fabricators who require accelerators or promoters can obtain technical data on Plastiset from Lucidol Div., Novadel-Agene Corp., 1740 Military Rd., Buffalo 5, N. Y.

Mucostat, a dental impression material which is basically a vinyl, has been formulated by the Bell Dental Products Co., Inc., 234 W. 56th St., New York, N. Y. It is a permanently elastic mouth impression powder and liquid combination that, according to the developers, has proved very satisfactory to the dental profession. There is reportedly no loss of dimension or detail over a long period of time, and the elastic qualities of Mucostat permit the pouring of many duplicate stone or plaster models from the same impression.

COMPANY NEWS

Vio-Glo Plastics Corp., 479 Avenue of the Americas, New York 11, N. Y., has been recently organized to manufacture and market plastic blacklight lamps and luminescent plastic products, including Vion blacklight signs and Fluor-Glo fluorescent plastics.

Kurz-Kasch, Inc., plastic molders of Dayton, Ohio, has announced appointment of H. J. Kasch, Jr. as district supervisor for the Indiana territory. Mr. Kasch has been with the company for 11 years in both sales and administrative positions.

Steiner Plastics Mfg. Co., Inc., 47-30 33rd St., Long Island City, N. Y., fabricators of acrylic resin, has appointed Robert M. Brosious of J. B. Products Co., 2413 Clybourn Ave., Chicago, Ill., as its representative in the Chicago area. Mr. Brosious was formerly with E. I. du Pont de Nemours & Co., Inc., and more recently represented the Rohm & Haas Co., Acrylic Sheet Dept. in Chicago.

The Pyrometer Instrument Co. has announced completion of its new plant, laboratory, and office at Bergenfield, N. J., and has moved from its old address at 103 Lafayette St., New York, N. Y.

Dow Corning Corp., Midland, Mich., has opened a southwestern sales office at Dallas, Texas, to better service consumers in the area and to handle a recently introduced line of silicone consumer products. It will be under the direction of Max H. Leavenworth, a former Dow Corning technical representative.

The Stanley Sapery Co., 341 Madison Ave., New York 17, N. Y., representatives of plastics manufacturers and designers in displays and packaging, has added to its organization: Harold Gibbs, Robert Conkwright, and Gilbert Glass.

Pyro Plastics Corp. has moved its factory facilities and offices from Westfield, N. J., to larger and more adequate quarters at Union, N. J.

Hardesty Chemical Co., Inc., 41 E. 42nd St., New York, N. Y., manufacturers of plasticizers used with vinyl resins, synthetic rubbers, etc. announces the formation of a British affiliate, The Geigy-Hardesty Co., Ltd., Manchester, England, which will produce sebacic acid and related compounds. Geigy already manufactures plasticizers in Manchester under the name of Geigy Co., Ltd. The processes and experiences of Hardesty Chemical Co. will be utilized and adapted.

Hamilton Veneer Co., a subsidiary of United States Plywood Corp., has begun construction on a new $1,500,000 plywood plant in Orangeburg, S. C.; this will be United States Plywood's second plant in Orangeburg. When the new plant gets into full swing, it is expected that capacity production will be 3,000,000 ft. of ¼-in. hardwood plywood per month.

National Engineering Products, Inc., manufacturers of plastic sealing, abrasive, and other specialty compounds, has moved its offices from the Commerce and Savings Bldg. to the Washington Bldg., Suite 435, 15th and New York Ave., N.W., Washington 5, D. C.

R. S. Aries and Associates, consulting engineers and economists, 26 Court St., Brooklyn, N. Y., has been organized to combine engineering and economics research through the association of a group of experts in both fields. Dr. Aries is also an adjunct professor of chemical engineering at the Polytechnic Institute of Brooklyn; he has recently developed a process for pulping hardwoods as a new source of paper and plastics, and is widely known for his research in lignin.

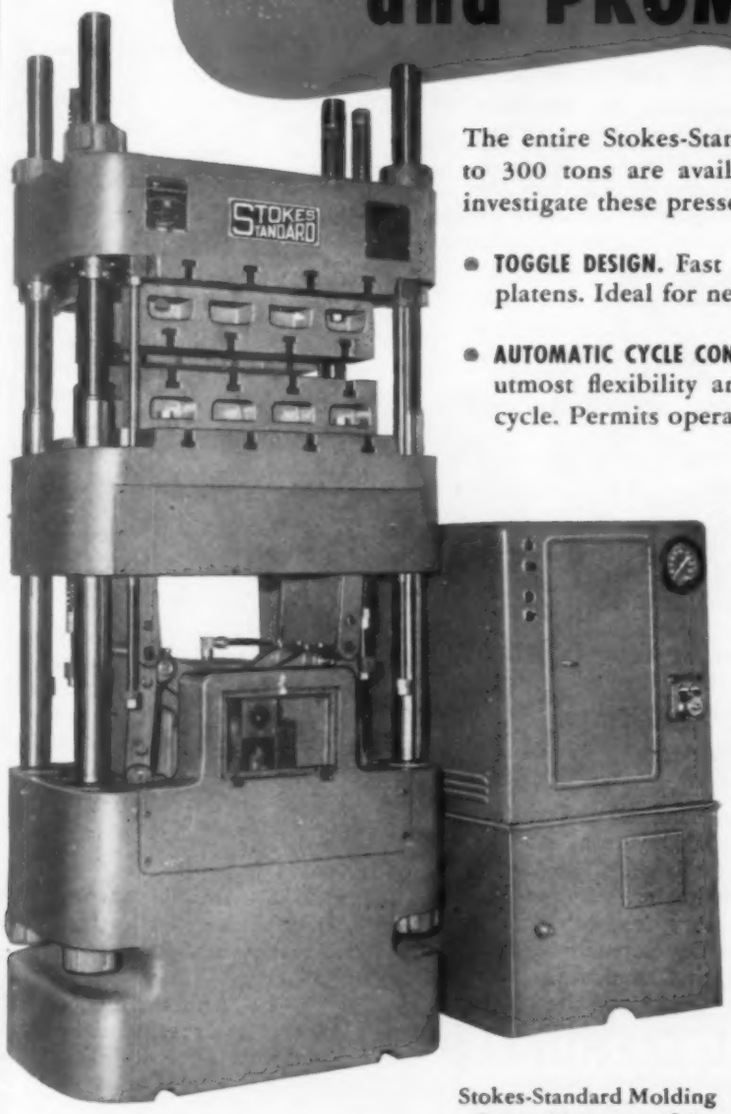
Foster D. Snell, Inc., chemists and engineers, 29 W. 15th St., New York, N. Y., has announced a further expansion of its services to clients abroad. The latest association is with Drs. Bredt and Van de Kasteele of N. V. Technisch Chemisch Adviesbureau of Eindhoven, Netherlands.

Imperial Chemical and Plastics Corp., 8 W. 40th St., New York, N. Y., has introduced the trade name Imperialyte for the firm's complete line of vinyl plastic sheeting. It is available from 0.004 to 0.024 gage, in 36, 48, and 54-in. widths, and in a wide range of colors, clear, translucent, and opaque.

Lumite Div. of the Chicopee Mfg. Corp., 40 Worth St., New York, N. Y. has added three new sales representatives: John H. Campbell, formerly of American Cyanamid Co., and William P. Middeleer will represent the Lumite screen cloth sales department, and William A. Kerrigan will work on Lumite upholstery fabric sales.

Plaskon Div. of Libbey-Owens-Ford Glass Co., Toledo, Ohio, has opened a regional sales office in Greensboro, N. C., to service the

LOWER INVESTMENT
CONTROLLED QUALITY
HIGHER OUTPUT
and PROMPT DELIVERY



Stokes-Standard Molding Press, 200-ton model.

The entire Stokes-Standard line has been redesigned. Models from 50 to 300 tons are available. If you need additional molding equipment investigate these presses. Their specific advantages include:—

- **TOGGLE DESIGN.** Fast in the clear, slow in the mold. Perfectly aligned platens. Ideal for nearly all molding applications.
- **AUTOMATIC CYCLE CONTROL.** New patented bar type controller provides utmost flexibility and reliable control for all steps in the molding cycle. Permits operator to run more than one press.
- **SELF-CONTAINED "PACKAGED" UNIT.** Designed to facilitate operation and maintenance. May be set up independent of existing equipment.
- **LOW HYDRAULIC PRESSURES.** Little operating power required. Small pumping unit with large capacity. Low maintenance costs.
- **NEW, EFFICIENT HYDRAULIC EQUIPMENT.** Provides faster press time, more heats per hour. Simple adjustments for speed and pressure.
- **SLOW-CLOSE CONTROL.** Automatically reduces speed of closing under final compression. Improves quality of moldings. Saves material.

F. J. STOKES MACHINE CO.
5934 Tabor Rd., Philadelphia 20, Pa.
Offices... New York, Chicago, Cincinnati
Pacific Coast Rep.: L. H. Butcher Co., Inc.
Agents in Principal Foreign Countries

F.J.Stokes FJS Est 1895 *Plastics* **MOLDING EQUIPMENT**

THE PLASTISCOPE

company's glue sales in that area. Charles L. Neeley, district sales manager, is in charge.

Plastic Film Corp., Plainfield, Conn., has introduced color printing on Syntilon, a cast vinyl film. The four-color printing is done on rollers at the time the film is cast, thus making a continuous operation. The finished film retails at about 79¢ per yard.

PERSONAL NEWS

Frank H. Faycik, formerly with Cornell Dubilier Corp., has joined the Plastylite Corp., 731 W. Front St., Plainfield, N. J., as chief engineer.

C. J. O'Connor, president of Reichhold Chemicals, Inc., has out-Gunthered John Gunther. While Mr. O'Connor was making a recent trip around the world, he mailed memos to his home office which so intrigued the company readers that they edited them and printed a few copies in book form. Mr. O'Connor's little book is a frank and life-like chronicle of what a business man thinks and sees in his travels. It is in the lingo of an articulate American businessman and is understandable, entertaining, and full of wit. There is nothing in it about plastics as such, but in the words of Mr. O'Connor, you become a philosopher "when you feel the need of answering questions to yourself that you formerly left to others," and his book is full of both the questions and the answers. For an evening's entertainment, you can't beat it!

W. Howard Stagg, plastics engineer specializing in molding problems and plant layout, has moved to 1321-25 W. Tioga St., Philadelphia 40, Pa.

Glenn P. Smith, formerly of the United States Rubber Co., Naugatuck Chemical Div., and chief engineer of the Atlantic Tubing and Rubber Co., Cranston, R. I., has established a consulting engineering service for the rubber, chemical, and plastics industries, at P. O. Box 1641, Providence 1, R. I.

Dr. Harold Naidus, formerly senior chemist for Publicker Industries, has joined the research staff of the American Polymer Corp., Peabody, Mass. In his new post he will do research and development work in high polymers for application to the adhesive, coating, and textile industries.

Charles H. Harris has been named manager of the new Decatur, Ill., works of the General Electric Plastics Div. Mr. Harris has been assistant to the manager of the plant, and works accountant. He first came with General Electric in 1930.

Ernestine Gilbert has resigned from Mastercraft Plastics Co., Inc., and is now connected with the Blue River Plastics Mfg. Co., 6 Green St., New York, N. Y., as treasurer and sales manager.

Francis Dougherty, Jr. has been advanced to the presidency of the F. J. Stokes Machine Co. and F. J. Stokes has become president of the board. Mr. Dougherty has been with the Stokes organization since 1928.

Arthur E. Willert, formerly with the F. W. Woolworth Co., has been appointed manager of sales by the Rogers Plastic Corp., North Wilbraham, Mass. He will be established in Rogers' New York office.

Arthur deAngelis has established offices at 1720 Sansom St., Philadelphia 3, Pa., with Thom Street, industrial designer, as a consultant on plastics industrial applications and merchandising aids. He is also serving as an instructor in the use of plastics at the School of Industrial Arts under the auspices of the Philadelphia S.P.I.

William E. Brackett has been appointed sales manager of Daystrom Laminates, Inc., Daystrom, N. C.

Hugo L. Schaefer, Jr. has been named laboratory research director of the Saran Development Laboratory of The Dow Chemical Co., Midland, Mich., following the recent transfer of former Director Lowry to Dewey and Almy Chemical Co.

William M. Fraser has been appointed vice-president of Glass Fibers, Inc., in charge of Eastern Textile Sales and Engineering. Glass Fibers, Inc., producers of Vitron fibers, has established eastern offices in the Hospital Trust Bldg., 15 Westminster St., Providence, R. I.

Clarence W. Coe has been appointed works manager of the Shaw Insulator Co., Irvington, N. J. Mr. Coe was works manager for the Plastics Div., Chemical Dept., General Electric Co. in Ft. Wayne, Ind., and Decatur, Ill., prior to his present appointment.

Gerald A. Griess has been advanced to the position of laboratory research director of the Styrene Polymerization Laboratory at The Dow Chemical Co., Midland, Mich.

William Di Leo has joined the plastics section of the research testing, and service laboratory of Lupomatic Industries, Inc., 4510 Bullard Ave., New York, N. Y. He is to exploit the firms's processes for tumbling plastic parts to a high finish.

T. A. O'Brien, formerly general manager and treasurer of Tech-Art Plastics Co., has joined Northeastern Molding Co., 15 Whiting St., New Haven, Conn., as executive vice-president and director. Harry T. Fehn will continue as general manager at Northeastern.

Ralph C. Shuey, manager of San Francisco, Calif., sales engineering activities of the Bakelite Corp., has retired after 27 years of close association with the plastics industry.

G. P. Humphrey, plastics manufacturers representative, has moved his sales and purchasing offices from Long Island City, N. Y., to the Esquire Bldg., 366 Madison Ave., New York 17, N. Y.

Oliver P. Clipper has joined the coating compound sales force of Plaskon Div., Libbey-Owens-Ford Glass Co., Toledo, Ohio. Mr. Clipper was production manager of the coating resin plant prior to his sales appointment.

Meetings

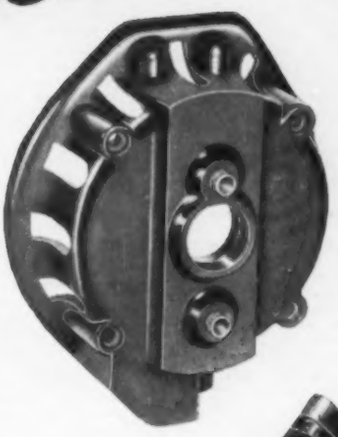
May 20-21—Annual meeting of the Society of the Plastics Industry, Hotel Ambassador, Atlantic City.

May 27-29—Annual meeting of the Society for Experimental Stress Analysis, Hotel Roosevelt, Pittsburgh, Pa.

June 21-25—Annual meeting of the American Society for Testing Materials, Detroit, Mich.

Sept. 27-Oct. 1—Third National Plastics Exposition, Grand Central Palace, New York, N. Y.

here is a * PROBLEM in HOUSING



To produce a Cloth-Cutting Machine housing . . .

1 . . . light in weight for portability.

2 . . . of an insulating material to prevent electrical surface shock.

3 . . . to be a non-conductor of heat as housing holds a motor.

4 . . . to have sufficient impact strength to withstand handling.

5 . . . plus many inserts placed with precision accuracy.

*SOLVED and PRODUCED by INSULATION

Cloth-Cutting Machine housing
made by Insulation for
U. S. Cloth Cutting Machine Co., N. Y.

INSULATION MANUFACTURING CO., INC.

Custom Molders of Plastics for Industry

13 New York Avenue • Brooklyn 16, N. Y.

All classified advertising payable in advance of publication. Minimum, $5.00 (up to 60 words); in border, $10.00 per inch

Classified Advertisements

For further information address Classified Advertising Dept. MODERN PLASTICS 122 East 42nd St., New York 17, N. Y.

HYDRAULIC PRESSES, 30"x52", 24" ram, 700 tons; 30" x 30", 20" ram, 1000 tons; 30" x 30", 17" ram, 340 tons; 20" x 24", 19" ram, 350 tons; 42" x 42", 16" ram, 250 tons; 36" x 36", 16" ram, 250 tons; 36" x 36", 12" ram, 141 tons; 36" x 52", 14" ram, 385 tons; 26" x 30", 15" ram, 177 tons; 20" x 20", 13" ram, 160 tons; 24" x 26", 10" ram, 118 tons; 19" x 24", 10" ram, 78 tons; 23" x 17", 8" ram, 75 tons; 22" x 15", 8" ram, 75 tons; 15" x 15", 8" ram, 75 tons; 12" x 12", 7⅛" ram, 50 tons; 12" x 12", 6⅛" ram, 42 tons; 8" x 9⅛", 4⅛" ram, 20 tons; 10" x 10", 3⅛" ram, 12 tons; New Dual Pumping Units; HPM Triplex 1⅛ GPM 2500#, Robertson Duplex 1-2/3 GPM 4000#; Worthington 2⅛ GPM 4000#, W&S Duplex 1 GPM 2500#, 4 plunger 6 GPM 2000#; Laboratory Presses all sizes; Laboratory Mills, New Units 6" x 12" M.D., 10" x 24" and 16" x 30", 36", 40" and 42" Mills with Drives; Extruders, Plastic; NRM 1½" and 2½" units; W&P unjacketed sigma blade 100 gal. Mixer; Preform Machines; Stokes R, Colton 5T; Hydro-Pneumatic and weighted type Accumulators, etc. HIGHEST PRICES PAID FOR YOUR USED MACHINERY. Universal Hydraulic Machinery Company, 285 Hudson St., N. Y. C. 13.

FOR SALE Hydro Pneumatic Accumulator, 13 Gal. 3500#. 25 Ton "C" Frame Type, High Speed Self Contained Hyd. Press Ball & Jewell Rotary Cutter. Model R Stokes Tablet Machine. 50 Ton Press with 18" x 18" Electric Plates. 100 ton 20" x 20" press. Racine Pumps, Boosters, Valves, Logan Pumps, Valves. Self-Contained—200 H.P. 78 Gal. 3000# Pump. 200 H.P. 200 Gal. 1500# Pump 18" x 15' Accumulator 1500#.—15" x 11' Acc. 400-2000". 6" x 9' Accumulator-2000#. 300 Ton Press 20" Ram, 8" Stroke, 24" x 20" Platen. 500 Ton—1000 Ton Hobbing Press—Hele Shaw Variable Pressure 33 GPM 2500#—Vickers Oil Pumps 17 GPM 500 to 1000#. Elmes Horo. 4 Plunger 6—Gals. 5000#.—Stillman 12"x12" Laboratory Presses. Aaron Machinery Co., 45 Crosby St., NYC.

FOR SALE—Compact Molds for injection molding. For molding large round compacts and other styles. Some styles with tools, puffs, sifters, cartons and parts. Will sell cheap. Affiliated Enterprises Co., 85 Van Braam St., Pittsburgh 19, Penna.

CASH PAID

For Capital Stock or Assets of Industrial Enterprise

WANTED—By large financially powerful diversified organization wishing to add another enterprise to present holdings. Existing Personnel Normally Retained. Strictly confidential. Box 1230, 1474 B'way, New York City.

DO YOU NEED a Hydraulic Press for Compression Molding, Transfer Molding, Laminating, Forming, Bending, and Hobbing? Many sizes hydraulic presses and pumping units available. New motors from 2 to 7½ H.P., 220 volts, 3 phase. Whatever it may be, if it is hydraulic, see Sal-Press Company, 388 Warren Street, Brooklyn, N. Y.

WANTED: PLASTIC Scrap or Rejects in any form. Cellulose Acetate, Butyrate, Polystyrene, Acrylic, Vinyl Resin, etc. Also wanted surplus lots of phenolic and urea molding materials. Custom grinding and magnetizing. Reply Box 318, Modern Plastics.

USED HYDRAULIC PRESSES, PUMPS & HYDRAULIC POWER UNITS

LUNNEY CARSON COMPANY
17th & Cambria Sts.
Philadelphia 32, Pa.

CUSTOM INJECTION molding: $2.70 per hour 4 oz. machine, $3.15 - 8oz. on steady run. Complete mold making and maintenance. Reply Box C585, Modern Plastics.

FOR SALE—1—Watson-Stillman 225 ton, 30" x 28" platen, 16" ram; 3—Southwark 225 Ton, 31" x 19" platens, 16" ram; 1—Burroughs 150 ton, 28" x 13" platens, 2—9" rams; 2—Baldwin-Southwark 110 ton, 24" x 18" platens, 11" ram; 3— Watson-Stillman 60 ton, 12" x 12" platens, 8" ram; 1—12 ton, 15" x 15" platens, 3½" ram; 2—Steam Driven Hydraulic Pumps, 15 and 30 GPM, 3000# and 5000#; 1—Baker Perkins 100 gal. jacketed double arm Mixers; 25—Stokes Preform Presses "R", 2½"; DD2, 23 punch 1-3/16"; DD2, 31 punch 15/16"; 2—Stokes DD2 Rotary, 1-3/16"; RD4 Rotary, 1"; Colton Rotary, 35 punch, ¾"; Day Readco, from 4 to 150 gal. double arm Mixers; 2—Ball & Jewell #0 and #1 Rotary Cutters. BRILL EQUIPMENT COMPANY, 225 West 34th St., N. Y. 1, N. Y.

FOR SALE: 500 ton Hydr. Molding Press 42" x 48"; Field 500 ton 25" x 30" Francis 200 tons, 24" x 18"; Thropp 175 ton 36" x 36", 6 openings; also 20 to 250 tons from 12" x 12" to 36" x 36"; 40 ton Broaching Press; Watson-Stillman Hor. 4 Plgr. 1" x 2" x 4" H.&L. Pressure Pumps; HPM 1⅝" x 6" vertical triplex 10 GPM 2700 lbs.; 7 Hydr. Oil Pumps, Vickers, Oilgear, Northern, etc., Elmes 1" x 4" & 1¼" x 4" hor. 4 plgr. 5 to 8 GPM 4500 lbs. & 5500 lbs.; Elmes 2" x 6" hor. 30 GPM, 2500 PSI; Rumsey 4½" x 8" vert. Triplex 65 GPM 900 lbs.; Elmes 2½" x 4" hor. 17 GPM 850 lbs.; Hydr. Steam Pumps; Low Pressure Pumps 150 to 600 lbs.; Hydr. Accum; Stokes type 200-15 Ton Automatic Molding Press, Stokes Rotary Preform Tablet Machines 1-3/16", 1¼" and ⅝", also single punch; Injection Molding Machines 2 oz. to 12 oz.; Baker Perkins jacketed Mixers 100, 50, 20 & 9 gals. capacity; New Rotary Cutters; Rubber Mills; Calenders, Banbury Mixers, etc.; Heavy duty Mixers; Grinders; Pulverizers; Gas Boilers; etc. PARTIAL LISTING. WE BUY YOUR USED MACHINERY. STEIN EQUIPMENT CO., 90 WEST ST., NEW YORK 6, N. Y. Worth 2-5745.

HYDRAULIC SERVICING

Hydraulic installations—repairs modifications and hydraulic power units built to specifications by hydraulic specialists.

Hydraulic Service Company of N.Y.
4317 Richardson Ave., Bronx 66, N.Y.
Telephone: MUrray Hill 2-0276

FOR SALE—1—Watson Stillman Hydro-Pneumatic High and Low Pressure System, complete, 3000#; 12—Baker Perkins 100 gallon Plastic Mixers; 1—12" x 12" Press 7" Ram, Steel Heated Platens and Hand Pump attached; 2—24" x 24" Adamson, 10" ram, 2—opening Hydraulic Press; 2—La Pointe Hydraulic Pumps, 150 G.P.M.—2000 lb. pressure direct motor driven to 125 HP AC motors; 1—French Oil Hydropneumatic Accumulator; 1—14" x 24" Press, 9" ram; 2—Royale #3 Perfected Tubers; 1—Royale #½ Perfected Tuber; 1—16" x 42" Thropp Mill; 2—B & J #1 Rotary Cutters; 1—Cavagnaro 2 cylinder 10" diameter Vertical Hydraulic Extruder; 1—Devine #11 Vacuum Shelf Dryer, 17 shelves heated 40" x 42"; 1—Farrell 6" x 12" 2-roll Rubber Mill; 1—48" x 48" 3—opening Hydraulic Press, 4—10" diameter rams, 300 tons; Dry Powder Mixers; Pulverizers; Grinders; etc. Send for complete list. Box C581, Modern Plastics.

#1 BANBURY MIXER, chromium plated trough, stellite tipped blades, with 40 h.p. motor and starter; 2—Stokes No. 250 toggle type Preform Presses 80 ton motor driven. Send for news flash. BRILL EQUIPMENT COMPANY, 225 WEST 34th STREET, NEW YORK 1, N. Y.

MOLD SHOP SUPERINTENDENT WANTED At least 15 years experience required. Must be able to build or repair large and small molds, with precision and speed. Must be able to supervise tool department of 8 men. Box C632, Modern Plastics.

FOR SALE: brand new injection type Molds. One 6-cavity combination special designed beautiful Soap-Box, one 6-cavity Soap-Dish, one 6-cavity novelty item and one 4-cavity tumbler Mold. All four Molds to fit the 8-ounce Reed-Prentice or any other injection machine. Molds are brand new and in perfect working conditions for immediate possession. Reply Box C566 Modern Plastics.

REPRESENTATIVES WANTED for vinyl film mfgrs. of well advertised products offering solids & large variety of printed designs up to 54" width for various mfrg. trades. Southwest & entire West Coast territory open. Box MP756, 113 W 42 St., NY 18.

FOR SALE

Stock of Saran Tape mfg. by National Plastics Products Company, 2" x .030"

1200 lb Red
1000 lb Green
3900 lb Yellow

50¢ per lb fob our factory

Timmerman Lumber & Mfg. Co.
Hibbing, Minnesota

FOR SALE—Small injection molding plant—new equipment. Box C619 Modern Plastics.

FOR SALE
COATING/LAMINATING PLANT

For Paper Converting
42" and 28" Reverse Roll

TRANSVERSION CORP.,
200 FIFTH AVE., NEW YORK 10, N.Y.

FOR SALE (2) Two Hydraulic Double Ram Presses 24" & 54", 7 openings each. Box C617 Modern Plastics.

DEVELOPMENT ENGINEER PH.D. Chemical Engineer. Outstanding young man with experience in development, research, and production interested in joining staff of a company manufacturing laminates, molded products, or specialties. His exp. includes compounding of resins, design and testing of plastic products, and manufacture by extrusion, lamination, casting and molding. Available in August. Box C616 Modern Plastics.

TURKEY Plastic concern in Istanbul interested in association with enterprising and credited industrialist wanting to start business in Turkey, in the fields of Compression Injection, Extrusion or Calendering. Also wishes to communicate with Mfgs of Molding Powders, resins, dyes, related chemicals and materials; machinery and equipment for plastics industry. Address: Kayhan Caglayan, P. K. 1300, Istanbul, Turkey.

SALES REPRESENTATIVE

Nationally known Adhesive Company has several openings in its Sales Department for qualified representatives with some experience, and willing to travel. Will handle complete line of Industrial Glues, Cements and Adhesives, for specific and diversified purposes, in individual territories as follows:

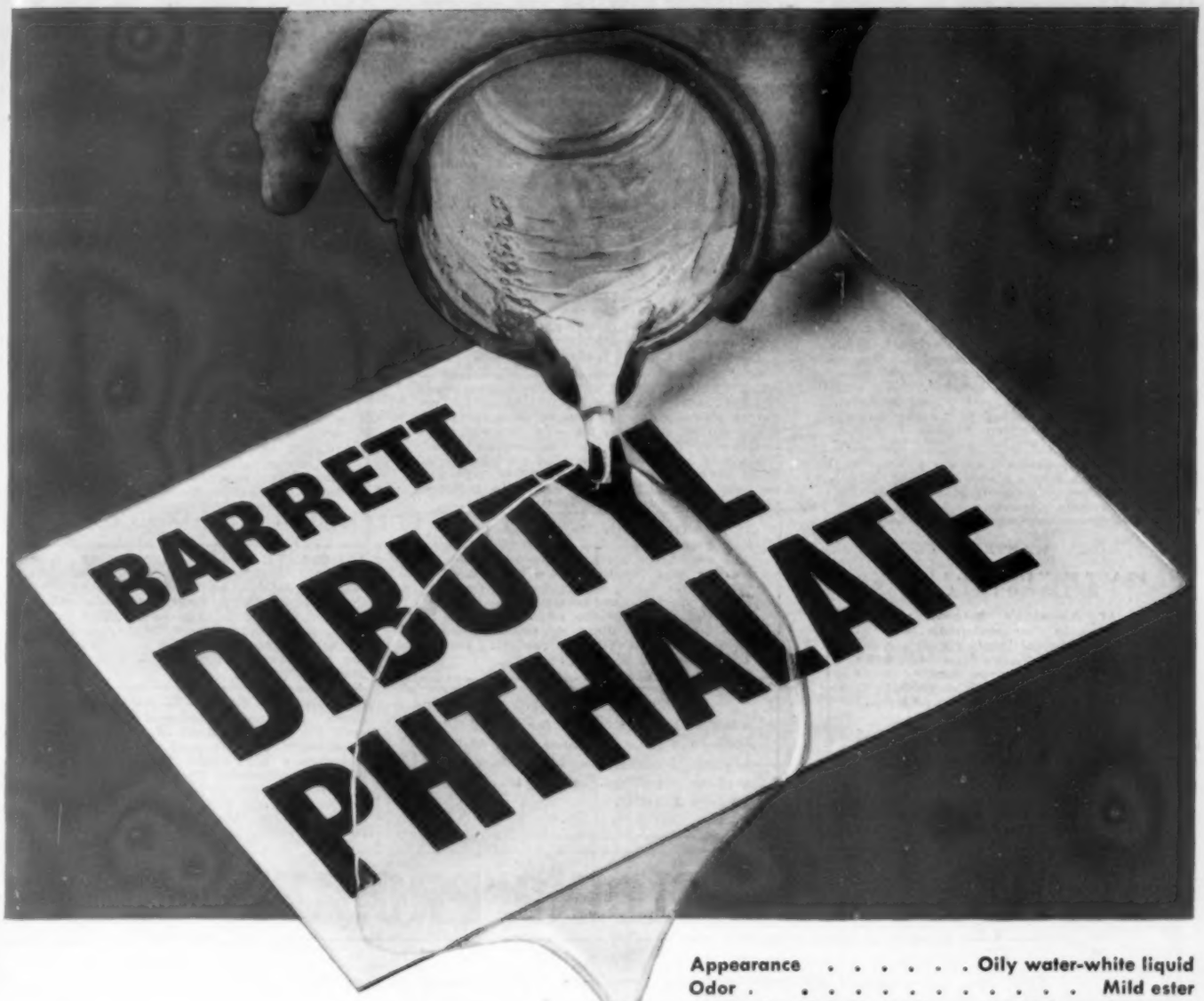
Hdqtrs. Atlanta, Georgia
(cover Southern States)

" Cincinnati, Ohio
(cover North Central States)

" Chicago, Illinois
(cover Illinois, Missouri, Kansas, Colorado)

State age, education, experience and salary desired. Reply Box C618 Modern Plastics.

GRADUATE CHEMIST AVAILABLE: Offer extensive exp. with one of leading low pressure molders and laminators. Know both autoclave and room temperature bag molding. Worked with urea, phenolic, resorcinol and metal to metal adhesives. Expert Liaison between factory and laboratory. Would be especially valuable in boat or airplane parts manufacture. Available immediately. Box C620 Modern Plastics.



Appearance	Oily water-white liquid
Odor	Mild ester
Acidity (as Phthalic Acid)	0.01% by weight max.
Specific Gravity 20/20°C	1.047-1.049
Assay (ester content)	Minimum 99% by weight
Weight per gallon	Approximately 8.75 lb.

Containers: 50-55 gal. one-way steel barrels

* * *

THIS clear, high-boiling, water-white liquid is being widely used as a modifying agent and plasticizer with natural and synthetic resins as well as with certain synthetic elastomers.

It is especially recommended for use in nitrocellulose lacquers. Its compatibility and high plasticizing efficiency increase the elasticity of the finished coating.

Barrett Dibutyl Phthalate is well within A.S.T.M. specifications. Its excellent color and low odor suggest its use in special products such as fingernail lacquers and paper coatings.

DICYCLOHEXYL PHTHALATE

A white powder used in supported coatings and unsupported vinyl films. Imparts superior resistance to water and oil absorption.

PLASTICIZER 50-B

An excellent liquid solvent for vinyl resins, used in supported and unsupported vinyl sheeting and extruded vinyl products.

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.
In Canada: The Barrett Company, Ltd.,
5551 St. Hubert St., Montreal, Que.

Barrett

FOR SALE—Complete unit for extrusion, orientation, annealing and take-up of monofilaments. Also 10' conveyor table with variable speed drive. Several monofilaments, ribbon and tubing dies included. Extruder 1¼" screw. Condition very good. Total use 150 hours. Original cost exceeded $5000.00 (1947). Bids and correspondence invited. Reply Box C621 Modern Plastics.

OLD ESTABLISHED cutlery mfgrs. require substantial quantities stag-type handles for carving sets. Box C625 Modern Plastics.

FOR SALE

Almost new Ball & Jewell cutter. Heavy duty; 5 h.p. motor. $750.

Two roll mill, 16 x 36; 50 h.p. motor, auxiliaries, $2500. Reply Box C624 Modern Plastics.

PLANT PRODUCTION MANAGER: With KNOW HOW exp. in all phases of transparent plastic acetate container fabrication, desires position in same or allied field with well established, progressive organization. Also qualified as plastics packaging consultant. Box C600, Modern Plastics.

MACHINERY AND EQUIPMENT for Sale: One Lammert & Mann Vacuum pump No. 6 S W D used 2 hours also 50 feet of 2 inch reinforced hose. Northern Plastics Corporation, La Crosse, Wisconsin.

WANTED

PLANT MANAGER FOR LARGE EXTRUSION PLANT

One of America's largest volume operations in the extrusion field is adding additional items requiring experienced extrusion man of high calibre. Pay commensurate with background. Opportunities unlimited. Experience in film extrusion and vinyl compounding of importance.

Reply Box C622 MODERN PLASTICS

MILLS WANTED—Two Plastic Mill Units preferably 18" x 54" or larger. Complete with motor, speed reducer and accessories. To be in first-class condition. State full details. Box C629, Modern Plastics.

PRODUCTION ENGINEER with experience in plastic sheet materials. Must be thoroughly acquainted with processes connected with fabricating of thermoplastic and be able to supervise tool design, estimate costs and develop new techniques. Exc. opportunity for right man. Plant located in East. Give full details. Box C626 Modern Plastics.

Wanted PACKAKING SALESMEN to sell Weinman Transparent Plastic Boxes in certain territories. Commission basis. Mention territories covered and lines now selling. Weinman Bros. Inc., 325 N. Wells St., Chicago 10, Ill.

MANUFACTURING - DISTRIBUTING SALES SERVICE

PROMINENT CUSTOM MOLDER with established plant, assembly and storage facilities offers complete service. Your item or molds handled through all phases of manufacture and distribution. We also will purchase or rent suitable plastic molds. Reply Box C623 Modern Plastics.

SALES EXECUTIVE Nationally known eastern fabricator in plastic sheet material requires thoroughly experienced sales executive with ability to develop and market new items. Must have some engineering knowledge and sales experience in plastic. Write fully giving experience, education, age and present salary. Replies treated in strictest confidence. Box C627 Modern Plastics.

FOR SALE Centrally located injection and compression plant. This is a going business with adequate business booked and pending. We have very reasonable labor available and practically no local competition. Because of insufficient working capital we will sell our entire plant or retain part interest for additional capital. Box C628, Modern Plastics.

PLASTIC EXTRUDER for sale 1½" Modern Plastic Machine electrically heated. Excellent condition—may be seen in operation. Reply Box C630 Modern Plastics.

WANTED—2 INJECTION MOLDING MACHINES, 6 to 12 ounce. One must be late model, good condition and reasonably priced. The other can be any condition but must be cheap. State make, model, condition, length of service, location and your lowest price for cash. Economy Precision Products Co., Germantown, Wis. Phone 461.

WANTED POST WAR 8 oz Reed-Prentice injection molding machines. State price and serial number. Reply Box C598, Modern Plastics.

WANTED: CHEMIST with experience in Phenolic Resins, Molding Compounds, and laminating Varnish, for research and development work. Write giving full particulars as to qualifications and salary expected. Replies confidential. Location: New Jersey. Box C631, Modern Plastics.

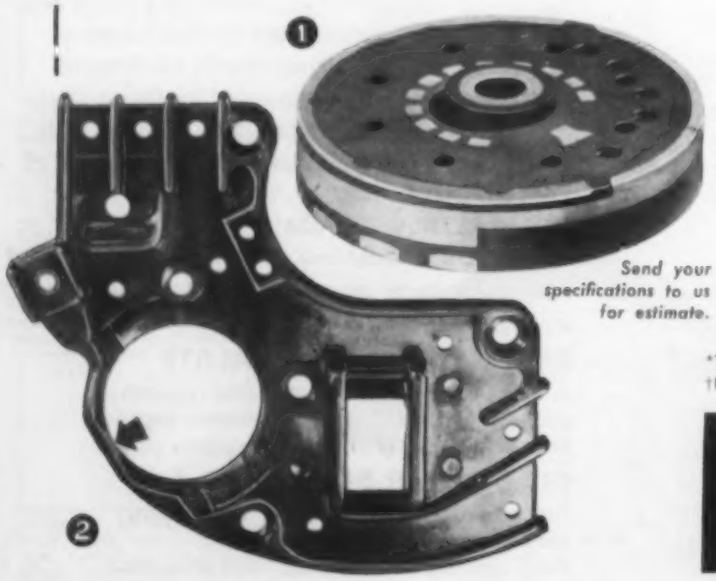
OVEN—CUSTOM BUILT, gas fired, with tracks. Suitable for hanging plastic sheets. 18" wide, 73" high, 82" deep. Also "Little Giant" paper shredding machine. 1½ H.P. A.C. Steiner Plastics Manufacturing Company, 47-30 33rd Street, Long Island City, N. Y.

AVAILABLE Master Engraver experienced in Mold Making, Hot cutting engraving. Wishes position as Superintendent, General Foreman or Chief Engraver. Interested to contact reputable firm fabricating point of sales, signs and counter display or Injection Molder of Tri-dimensional name plates. Only top executive position considered. Box C633 Modern Plastics.

EXPORT EXECUTIVE AVAILABLE cultured, personable, aggressive, Latin-American, 37, Long resident of US, college, solid knowledge exports and plastics. 14 years experience all world markets. Graduate Plastics Industries Technical Institute. Able create or assist develop export department has tremendous faith in the export possibilities of all plastics. Write James Cordova, 619 W. 176th St., New York 33, NY.

DO YOU HAVE A MOLDING "PROBLEM CHILD"?

You can rid yourself of your molding "problem children" by bringing them to us. As the second largest compression molder in the world, we have had great success in handling molding and mold-building problems involving thin wall sections, numerous inserts, undercuts and various other difficulties. Our engineers are experienced in simplifying mold designs for complex pieces, so that their production becomes practical and economical.



Send your specifications to us for estimate.

This split-ring commutator (1) was a compression molding "problem child" we produced for IBM.† Since the specifications called for high dielectric strength and good arc resistance, we molded it from Colasta*, our own rubber-base molding compound. The unit contains 28 precision-placed inserts, hence the placing of insert pins in the mold called for ingenious engineering design.

We molded this phenolic component for an automatic switch (2) for Gilbert & Barker Mfg. Co. Extreme care had to be exercised to prevent the thin wall section (arrow) from cracking during cooling. Tolerance in all dimensions had to be held very close.

You can be sure your compression molding assignment will be done properly—whether it is a "problem child" or a run-of-the-mill job, if you let us do it. We have the equipment, we have the personnel, we have the know-how. Our reputation proves this.

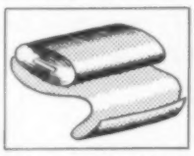
*TM registered
†INTERNATIONAL BUSINESS MACHINES CORP.

SPECIALTY INSULATION MFG. CO. INC.
HOOSICK FALLS, N. Y.

Rex does an expert match-making job in pairing extruded plastic coatings with various other substances to form new products or to add versatility to old items. Here are several base substances which Rex has wedded to extruded vinyl plastic coatings to make better, more serviceable articles:

EXTRUDED VINYL PLASTIC COATING

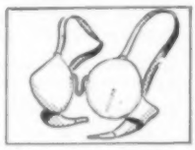
On copper wire. Used to make wire insulation.



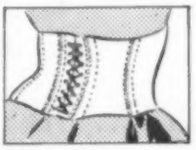
On thread. Used to make woven fabrics.

On cotton rope. Used to make dog leashes.

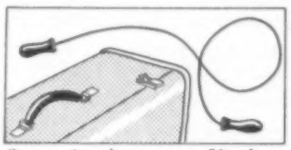
On soft iron wire. Used to make dress making forms.



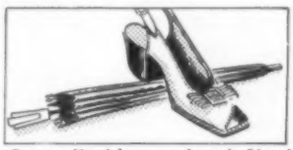
On steel spring wire. Used to make uplift brassiere supports.



On flat coil steel strip. Used to make corset stays.



On twisted paper. Used to make handles, jump ropes and giftwrapping.



On malleable metal rod. Used to make bag, shoe, umbrella, ornaments and fittings.

. . . . and many other products, too.

The proper application of these plastic coatings can make *your* product

- **BRILLIANTLY COLORFUL!**
- **WEAR RESISTANT!**
- **ADAPTABLE!**
- **A BETTER PERFORMER!**

Have you a *base substance* that we can cover by the continuous plastic extrusion method to make a new and better product? We would like to assist in its development. Write today.

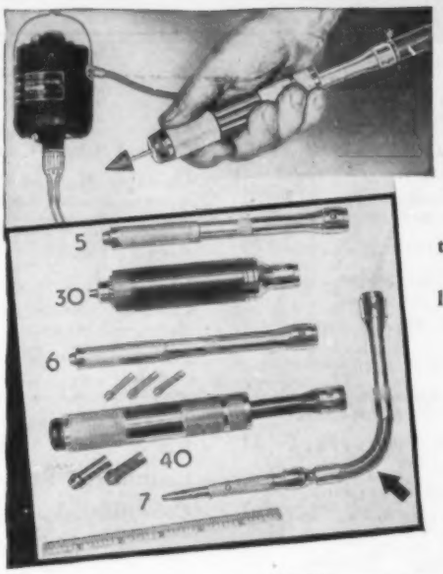
THE REX CORPORATION

Cambridge 39, Mass.

New York Office:
152 West 42nd St., N. Y. 18, N. Y. Wisconsin 7-4143

Extruders of Tubes, Sheets, Insulated Wire and Cable, Welting, Rigid and Flexible Shapes

FOREDOM Flexible Shaft MACHINES



5 quickly interchangeable handpiece types — pencil sizes and larger — some with flexible wrist—see arrow

Thousands of Enthusiastic Users Prove that FOREDOMS are *tops* in the Small Grinder Field

Here are 4 REASONS WHY!

1. **Extra power and longer motor life. Motor not dwarfed to fit hand.**
2. **Correct handpiece size for deft, sensitive fingertip control.**
3. **Complete range of handpiece types. You fit the tool to job at hand.**
4. **Small handpiece size lets you get into those "hard-to-reach" places.**

USE FOREDOMS to grind, polish, drill, rout, mill, saw, slot, clean, sand, etch, engrave, etc.

FOREDOMS are profitable additions to all departments—production, maintenance, or tool. Use the Flexible Shaft Machine that is fast becoming the standard for the nation. YOU TOO will say "My Foredom is the handiest tool in the tool crib—can't get along without it."

The FOREDOM line includes "hang-up" models as illustrated and easily-portable bench models. Foot rheostat is standard with most of them.

Our Catalog 159 gives you valuable information as to how you can profitably employ FOREDOMS. It will pay you to send for it.

Foredom Electric Co., Dept. 159
27 Park Place, New York 7, N. Y.

Please send us your catalog 159 showing the different uses of Foredom Flexible Shaft Machines.

Name .....

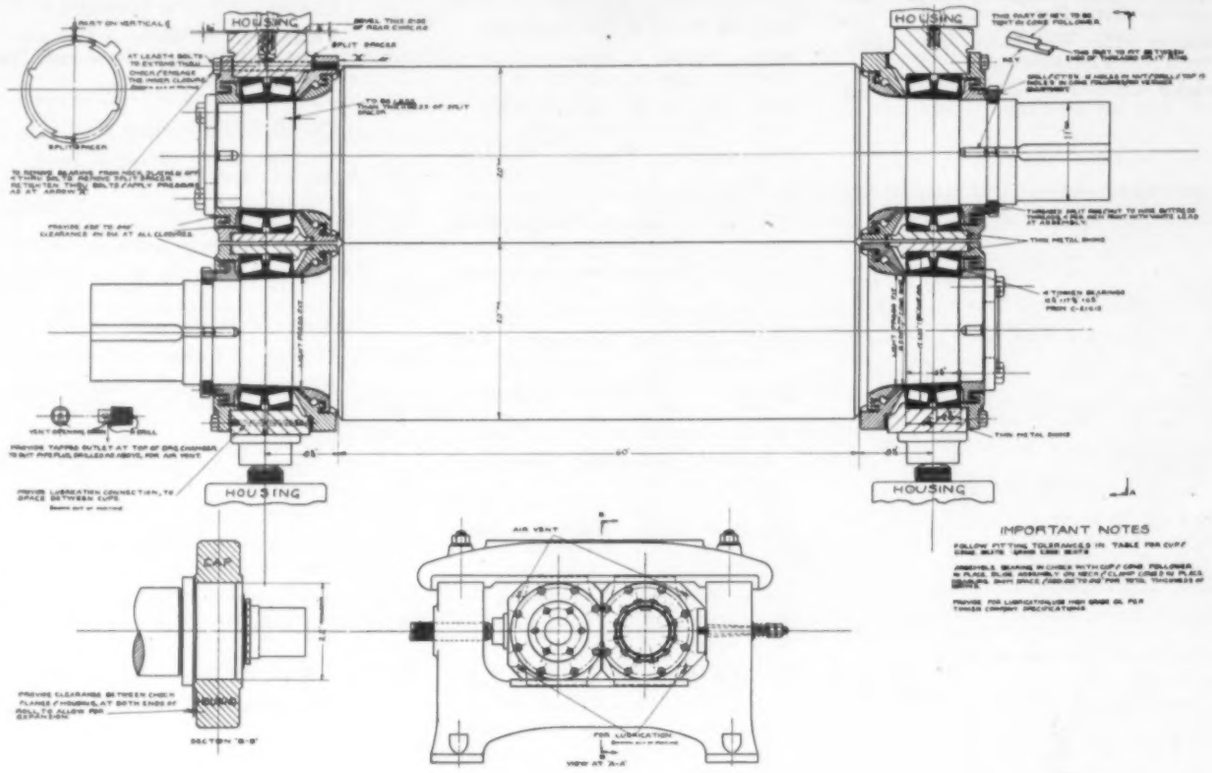
Address .....

City & Zone ..... State.....

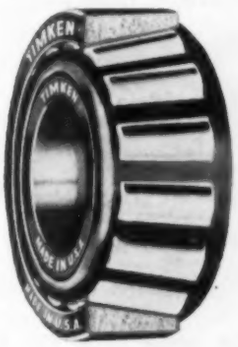
MODERN PLASTICS ADVERTISERS

MAY, 1948

(Please turn to Page 210)



How To Improve Plastic Mill Performance and Reduce Maintenance



Everything else being equal, plastics mills equipped with Timken Balanced Proportion Roller Bearings perform better, possess greater availability for service, last longer, cost less for operation and maintenance.

Mills have greater rigidity because Balanced Proportion Bearings make possible larger roll neck diameters with 50% to 60% increased neck strength. Load ratings are higher, too — up to 40% higher than previous designs of tapered roller bearings, size for size.

A typical example of the application of Timken Balanced Proportion Bearings to plastics mill roll necks is shown in the drawing. There is a standardized application ready for your new or existing mills. Consult the mill builder or our engineers.

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

THE TIMKEN ROLLER BEARING COMPANY, CANTON 6, OHIO
CABLE ADDRESS "TIMROSCO"

NOT JUST A BALL ◯ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ◎ AND THRUST —◎— LOADS OR ANY COMBINATION —◎—

(Continued from Page 208)

(Please turn to Page 212)

A BRESKIN PUBLICATION

MODERN PLASTICS

PUBLISHED BY MODERN PLASTICS, INC. • 122 EAST 42nd STREET, NEW YORK 17, N. Y.

IDEAL FOR APPEAL

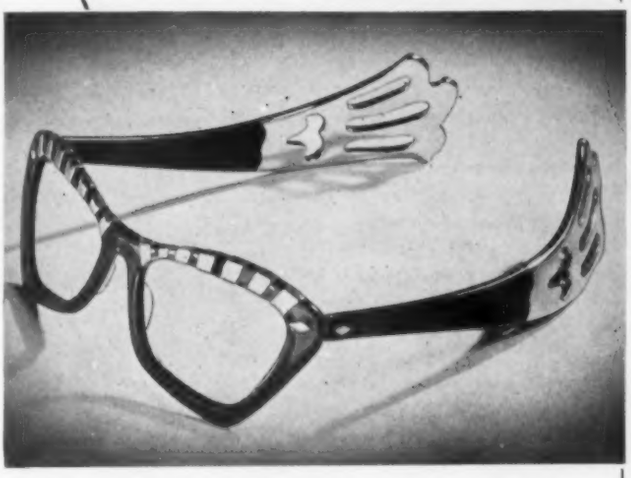
Eye appeal refers to more than decorative frames for eye glasses . . . it refers to the quality you can add to *any* plastic product by having it decorated with striking designs in precious metal through the special G.M.C.* Process.† A plastic article enriched with these original designs in dazzling gold or silver is transformed into an irresistible luxury item — an item that can be sold at a higher price and at a larger profit.

There is no spraying in the G.M.C. Process. An actual layer of precious metal is electrolytically deposited on the plastic surface — and it will not chip or rub off.

You can enhance the value and eye appeal of your plastic product and boost it into the luxury class by having it decorated with gold or silver by the G.M.C. Process.

Send for the complete details today.

Glasses by Zylo Ware Corp.



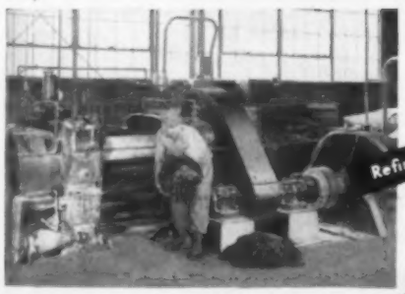
G.M.C. PROCESS CORP.

Manufacturers & Decorators in Electro-deposition

† Pat. Pending

46 GREAT JONES STREET, NEW YORK 12, N. Y. GRamercy 5-2313

* No connection with General Motors Corp.



SCRAP AND VIRGIN Plastics

Custom Grinding • Processing • Cleaning • Grading

OFFICES AND PLANTS THROUGHOUT THE UNITED STATES TO SERVE THE WORLD

A. Schulman Inc.
SCRAP and VIRGIN
Plastics

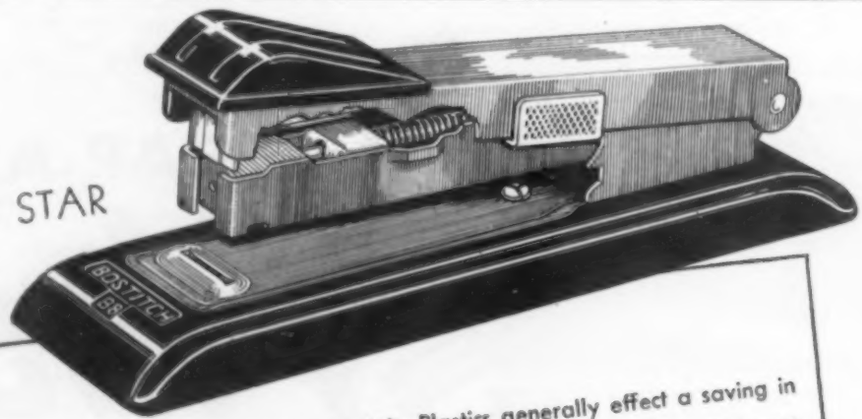
Offices: AKRON, NEW YORK, BOSTON, E. ST. LOUIS, LONG BEACH, CAL.
Warehouses: AKRON, JERSEY CITY, E. ST. LOUIS, LONG BEACH, CAL.

790 E. TALLMADGE AVE., AKRON 9, OHIO

(Continued from Page 210)

STITCH

YOUR WAGON TO A STAR



You and just about everyone else — including your best customer — are agreed that this is the "plastic age." Sure, you can point to the near-miracles being wrought every day with plastics.

But have you ever actually investigated how plastics can improve your product? Bostitch did! And the handsome, eminently serviceable stapler shown above is the result. The plastic parts, which are indicated in black and constitute over 40% of this stapler, were molded by NORTHERN from one of the popular plastic materials. Plastics generally effect a saving in costs. They are lighter. For many purposes they are stronger. They can't rust or corrode. And they look better.

Whatever plastic material is best suited to the special requirements of your product, NORTHERN is experienced and skilled in using and molding all of them. So may we suggest that — like Bostitch did — you "stitch your wagon to a star" and increase the serviceability and salability of your product with plastic parts molded by NORTHERN!

Northern INDUSTRIAL CHEMICAL CO.

39 Years of Plastic Molding Experience

8 ELKINS STREET — SO. BOSTON, MASS

BRANCH OFFICES

441 Lexington Ave.
New York, N. Y.
Tel. Vanderbilt 6-1684

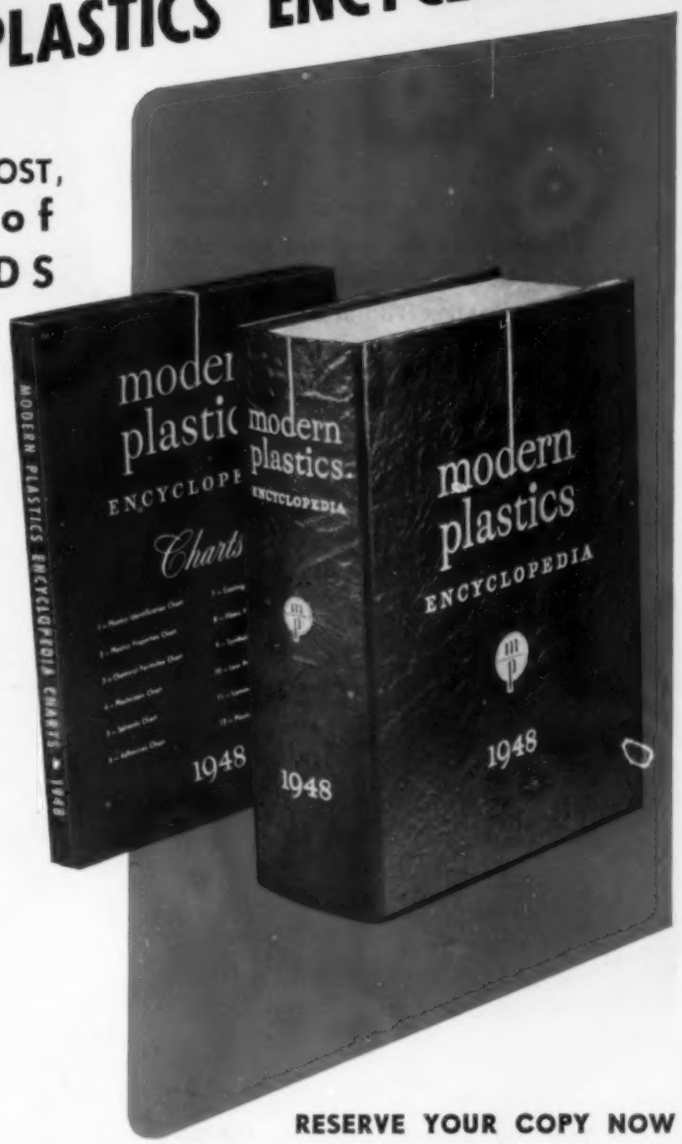
P. O. Box 476
Rochester 2, N. Y.
Tel. Charlotte 3270

P. O. Box 5604
Philadelphia 29, Pa.
Tel. Victor 8679

TO BE PUBLISHED SOON

NEW 1948 MODERN PLASTICS ENCYCLOPEDIA*

INCLUDING, AT NO EXTRA COST, The CATALOG of PLASTICS STOCK MOLDS



The new 1948 edition of the Modern Plastics Encyclopedia, the most authoritative compendium of plastics information and know-how in the world, will shortly be ready for mailing.

Bigger and more comprehensive than any previous edition, it covers all phases of the ever-changing plastics industry. It brings you up-to-date on plastics materials, product applications and production techniques and equipment. It reports on the major developments and changes that have occurred during the year — changes that may have important consequences for your business.

INCLUDES CATALOG OF STOCK MOLDS

This year for the first time, the Encylopedia will include *at no extra cost*, the invaluable Catalog of Plastics Stock Molds* which alone formerly sold for five dollars. Completely revised and up-to-the-minute, this catalog (last published in 1944) will illustrate over 2,000 stock molds and will cover molded parts, cast shapes and extrusions.

INCLUDES 12 PLASTICS CHARTS

These invaluable charts have been completely revised to incorporate recent developments. Two important additions — covering the properties of plastic films and laminates — bring the total to twelve. They're all boxed in a sturdy separate package.

NOW IN ONE HANDY VOLUME

An extensive survey showed us that 80% of thousands of users preferred a one-volume Encyclopedia. It's handy. It's easier to use for frequent reference. It takes less desk space.

CONTAINS COMPLETE DIRECTORIES

Also incorporated will be the valuable Directories of Manufacturers, Equipment, Personnel, Suppliers, Services, Trade Names and Molders' Marks. They're an exclusive feature of the Encyclopedia, obtainable nowhere else.

*REG. U.S. PAT. OFF.

PLASTICS CATALOGUE CORP.
122 EAST 42ND STREET, NEW YORK 17, N.Y.

RESERVE YOUR COPY NOW

If your company supplies or serves the plastics industry, or manufactures or uses plastics materials or components, you should have a copy of this all-new Encyclopedia for ready reference. Fill out the coupon and reserve your copy now.

Gentlemen: Please reserve my copy of the Modern Plastics Encyclopedia, which includes, *at no extra cost*, the catalog of Plastics Stock Molds and Set of 12 Plastics Charts.

PLASTICS CATALOGUE CORP.
122 E. 42nd St., New York 17, N. Y.

☐ Bill me.
☐ Enclosed is check for $8.50 prepaid.
(Canada $11 including duty and postage. $12 Foreign)

Name .....

Position .....

Company .....

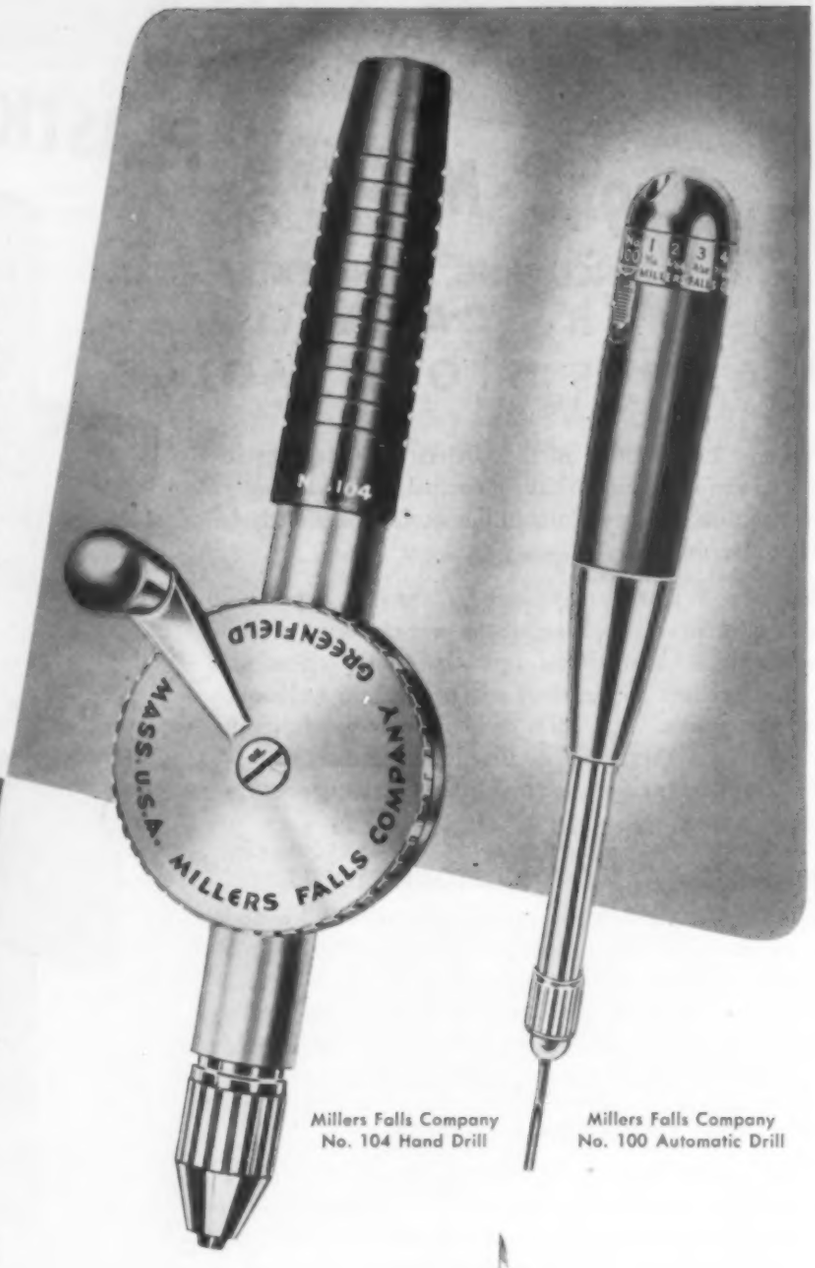
Address .....

.....

MP-5-48

Stand over the shoulder of a customer who is looking at either of these new and decidedly eye-catching Millers Falls Company Drills, for the first time. Part of his comment is quite apt to include ". . . and LOOK at that handle!" We are proud to have topped off two such uniquely constructed and attractively designed small tools with injection moulded handles perfectly in keeping with both qualities.

NEW DRILLS *with* Strikingly New Beauty Treatments



Millers Falls Company No. 104 Hand Drill

Millers Falls Company No. 100 Automatic Drill

You may want to undertake the redesigning of a product and investigate the application of plastics. Or your problem may already center on an injection moulded part — how to improve it or step up delivery of it to meet your own current production requirements. Whatever becomes your starting point of inquiry you can have full confidence in our desire to help you with undivided attention. As exclusively custom moulders, all, not just a part, of our experience and our extensive facilities are yours to command.

Custom Injection Moulding

WORCESTER MOULDED PLASTICS CO.

14 HYGEIA STREET, WORCESTER 8, MASS.

17 East 42nd St., New York 17, N. Y.

130 West Chippewa St., Buffalo 2, N. Y.

There's an extra burst of sales speed in

Many a fast-stepping item can be given an extra burst of speed—*sales speed*—with an eye-compelling package!

That's just what BAKELITE Styrene plastics are doing for many types of merchandise . . . thanks to their own inherent properties and the imaginative use to which they are being put by leading designers.

Versatile, light in weight, strong, and capable of varied decorative treatments and effects, this modern plastic material may be quickly and economically molded into boxes, display cartons, stands, cases, almost any type of package for almost any type of consumer goods. All the colors of the rainbow are available. Re-use is often a plus factor. And always BAKELITE Styrene plastic presents a challenge to creative package and merchandising experts who like to "show what they are made of."

In many ways, BAKELITE Styrene plastic is the ideal modern material for packaging uses. Consult your plastics molder, or write Department 5 for the helpful guidance of BAKELITE plastics engineers in adapting this material to your specific packaging requirements.

Data courtesy General American Transportation Corp.

TRADE-MARKS

BAKELITE

Styrene

PLASTICS

BAKELITE CORPORATION, *Unit of Union Carbide and Carbon Corporation* UCC 30 East 42nd Street, New York 17, N. Y.

● ENGINEERED IN PLASTICS BY GENERAL ELECTRIC

Bull's-eye for Plastics

● Plastics score a hit in this unusual application! Stocks for the new Hy-Score target pistols are molded in plastics by General Electric for the Hy-Score Arms Corporation, Brooklyn, N.Y. Called the world's most powerful air pistol, the Hy-Score requires a sturdy stock that will stand up under shock, resist perspiration and grease. G. E. selected a plastics that meets these specifications, then molded the stocks in four distinctive color patterns.

What is *your* plastics problem? Whether you sell pistols or perfume, General Electric's *complete* plastics service may help you lower production costs, improve your product. General Electric, world's largest manufacturer of finished plastics parts, is equipped to design, engineer, and mold plastics products to meet your individual requirements.

Write us for more information. Or get in touch with your nearest G-E Sales Office. We'll be glad to consult with you on any plastics job. Meanwhile, write for your free copy of the illustrated color booklet, "Problems and Solutions in Plastics." Address: Plastics Division, Chemical Department, General Electric Company, 1 Plastics Avenue, Pittsfield, Mass.

G-E COMPLETE SERVICE—AT NO. 1 PLASTICS AVENUE

Backed by 54 years of experience. We've been designing and manufacturing plastics products since 1894. General Electric research facilities have expanded continually, working to develop new materials, new processes, new applications for plastics parts.

No. 1 Plastics Avenue—complete plastics service—engineering, design, mold-making. G-E industrial designers work with our engineers to create plastics parts, sound and good looking. Skilled mold-makers in G-E toolrooms average over 13 years experience.

All types of plastics. Compression, injection, transfer and cold mold facilities . . . high and low pressure laminating . . . fabricating. G-E Quality Control—a byword in industry, means as many as 160 inspections and analyses for a single plastics part.

EVERYTHING IN *Plastics*

GENERAL ELECTRIC

CC48-A39

General Electric plastics factories are located in Scranton, Pa., Meriden, Conn., Coshocton, Ohio, Decatur, Ill., Taunton and Pittsfield, Mass.